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THE UNIVERSITY OF ALBERTA

OFFICE MACHINE TECHNICIAN PROGRAM VALIDATION

By

© REX AMUNDSEN NORTH

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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AND

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Office Machine Technician Program Validation," submitted by Rex Amundsen North in partial fulfilment of the requirements for the degree of Master of Education.

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Date: 1975

ABSTRACT

This study was conducted to establish the validity of the Office Machine Technician (OMT) program at the Northern Alberta Institute of Technology (NAIT), Edmonton, Alberta.

The rapid rate of technological change in the office machine occupational field led to the question of whether the OMT program required curriculum adjustment to keep the graduates fully employable.

The specific purpose was to investigate whether the curriculum and changes proposed by the OMT Advisory Committee were perceived to be relevant to the knowledge and skills required on the job.

The data was obtained by means of a specially designed paired-comparison questionnaire based on Thurstone's Law of Comparative Judgement. The sample populations included an exhaustive sampling of students completing the program from 1964 to 1974 and an exhaustive sampling of office machine service managers and dealership managers in the Edmonton area. All firms were included that were listed in the Yellow Pages of the Edmonton and District Telephone Directory under the typewriter, office equipment, adding machine, cash register, accounting machine and calculating machine classifications.

The data obtained yielded scale values, based on a

standard deviation of one and an arbitrarily assigned mid-point of zero, for each of the three responding groups; students, service managers and dealership managers. In addition, cumulative results for all respondents were obtained for each area of knowledge and area of skill that made up the curriculum and the Advisory Committee proposals.

Findings of the study indicated differences in the group scale values assigned by the student group and the management groups. Scale values for each area of the curriculum were similar for the service managers and dealership managers with two noteable exceptions. The scale values for the student group perceptions were markedly different from the similar perception patterns of the two management groups.

The two exceptions in which service managers' scale values were significantly lower than the values assigned by the dealership managers, were the sales knowledge, salesmanship area and the electronic repair skill area.

Cumulative results for all respondents were influenced by the larger number of student responses, but identified clearly the perceived importance of each area of curriculum.

Electronic theory and electronic component replacement skill were assigned scale values indicating they were perceived as most important for students to be able to perform on the job. Typewriter theory and adjustments, electrical theory, electrical repairs and electrical component replacement were rated from very important to above average in importance.

Typing skill, physical and leisure education were both perceived as least important as they received extremely low cumulative ratings.

Record keeping, sales knowledge, trade mathematics, salesmanship, calculations and records were assigned little importance when averages were calculated. Increased importance was perceived for communications theory, communications skill and organizational behavior. Typewriter component replacement and machine shop were above the midpoint on the scale values assigned, indicating a perception of above average importance.

Recommendations for further research include a study to identify specific elements of electronic training and their relevancy. Further curriculum recommendations were: elimination of the teaching of typing skill; and the limitation, with close review, of physical and leisure education. Recommendations were also made regarding the make-up of the OMT Advisory Committee and regarding follow-up methods to be employed for the future.

The viability of the paired-comparison questionnaire approach in curriculum research was demonstrated. It is recommended as a method of obtaining perceived relevance of training curricula to job requirements.

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CHAPTER I

Purposes and Significance of the Study

This chapter provides the background for the study, the purposes of the study, the significance, the design and the limitations of the study. It also delimits the study, expresses assumptions and provides definitions related to the study.

Background for the Study

The Office Machine Technician (OMT) program has been taught at the Northern Alberta Institute of Technology (NAIT) in Edmonton, Alberta, since 1963. In the intervening years, some adjustments of curriculum had been made on the advice of the OMT Advisory Committee. Recent technological changes resulting in rapid changes within the office machine field dictated a comprehensive review of the relevancy of the curriculum of this program.

NAIT functions as a specialized educational institution dedicated to meeting provincial needs for skilled non-professional manpower. Emphasis is placed on the immediate employability of graduates and on their preparation for continued advancement on the job.

Statement of the Problem

The purpose of this study was to establish whether the present curriculum of the Office Machine Technician (OMT) program was perceived to be relevant to what technicians were expected to know and do on the job. The recommendations for curriculum contained in the recent minutes of the OMT Advisory Committee were also to be examined for relevancy to the knowledge and skills required on the job.

Significance

The rapid and extensive technological change in the office machine employment field raised the question of whether OMT students were training for jobs that might disappear. The OMT instructors might also find their own skills and knowledge obsolete as new methods and equipment continue to be introduced. In addition, the administrators of the Northern Alberta Institute of Technology were concerned with the allocation of scarce resources to programs that might soon become obsolete.

The changes in the office machine field caused by the introduction of computers, electronic calculators and other concepts and new equipment were international in scope, and their significance for OMT training obviously critical.

The development of a satisfactory approach to establishing the relevancy of a vocational curriculum to

on-the-job requirements would have at least national significance in its application. Regardless of the possible use in guiding the development of technical and vocational employment training programs, the significance of its findings is considered primarily local because the investigation was limited to the Edmonton district.

Design

A pilot study was conducted to develop and test a paired-comparison questionnaire based on knowledge and skill areas of the present OMT curriculum. Areas of knowledge and skill previously recommended by the OMT Advisory Committee for inclusion in the curriculum were added to the questionnaire. Three groups were asked to complete the instrument, which forced comparative choices of each area of knowledge and of each area of skill. Choices were made based on which of the two areas presented, the respondent felt was the most important for technicians to be able to perform successfully on the job. The groups sampled in the final study were:

1. All students who completed the program from 1963 to 1974, regardless of whether they obtained a certificate by passing all the subjects.
2. All service managers of typewriter, office equipment, adding machine, cash register, accounting machine and calculating machine firms, listed

in the Yellow Pages of the Edmonton and District Telephone Directory.

3. All dealership managers of the above dealerships.

The responses were tabulated to yield a scale value for each of the groups, and for each knowledge and skill area of the curriculum. This permitted comparison of the perceptions and the importance assigned to any area of the curriculum by each responding group.

In addition, all responses received were tabulated to produce a cumulative scale value for each area of knowledge and skill, thereby establishing an over-all or cumulative ranking for each area of the curriculum.

Delimitations

The study confined itself to students who completed three full quarters of instruction in the OMT program. Early drop-outs were excluded, but students were included who may not have received a certificate because of a subject mark deficiency. They may well have gained and retained employment in the occupational field.

Only areas of knowledge and skill contained or previously contained in the OMT curriculum, or recommended in the OMT Advisory Committee minutes, were included in the questionnaire.

Dealership manager and service manager populations were restricted to those dealerships listed in the Edmonton

and District Telephone Directory and as further delimited in the design section.

Limitations

The perception of importance of areas of the curriculum to job performance was naturally subject to all personal variations of the respondents.

The sample suffered from experimental mortality, due to the inability to contact all students and due to non-responses in the service manager and dealership manager groups.

Questionnaires for both the service managers and the dealership managers were sent to the dealership managers and some collaboration on the completion of questionnaires may have occurred.

Contact with the respondents was limited to the questionnaire and, therefore, represented information obtained at one particular moment in time, rather than from a longitudinal study.

The paired-comparison questionnaire required matching of each knowledge area with each of the other knowledge areas and became unwieldy. This prevented a detailed analysis of the electronics training recommended, as the questionnaire became too lengthy.

Assumptions

It was assumed that all respondents had sufficient

experience on the job to understand and relate each knowledge and skill area's importance to their work requirements.

Experimental mortality acknowledged in the limitations was assumed to reflect a randomized loss of participants, which did not bias the sample.

Definition of Terms

T.V.T.A. is used throughout to signify the Technical and Vocational Training Act of 1961-67.

NAIT is the acronym used to designate the Northern Alberta Institute of Technology.

Advisory Committee refers to the Office Machine Technician (OMT) Advisory Committee drawn from Managers, Service Managers, and Graduates in the Edmonton area to provide advice to NAIT on the Office Machine Technician program.

OMT is used throughout to signify the Office Machine Technician program.

Relevancy refers to the perceived importance assigned by the respondents to each area of the curriculum based on what knowledge and skills they require on the job.

Curriculum refers to all courses of the program, including physical and leisure education activities.

Follow-Up Study is defined as a procedure for accumulating pertinent data from or about individuals after they have had a similar or comparable experience.

The related literature examined is reported in Chapter II, following some preliminary historical background data on technical and vocational education in Canada.

CHAPTER II

Related Literature

This chapter reports the review of literature related to the evaluation of technical and vocational education and curriculum. Follow-up studies, industrial surveys, system-wide studies and literature pertaining to the use of the paired-comparison questionnaire are also reviewed.

Historically, technical and vocational education received little attention from the Canadian Government until the 1910 Robertson Royal Commission On Industrial Training and Technical Education, to enquire into the state of employment education in the nation. Bryce (1970:4) reported the Commission's view that Canadian education is overly oriented to the academic. In their view, a complete revamping of the provincial system would be necessary to meet national needs for skilled, non-professional manpower. In 1919, the Technical Education Act set up the first federal legislation specific to technical and vocational education. The Assistance To Youth Training, occurring in 1937, later expanded to include the training of servicemen. The Vocational Training and Coordination Act of 1942 was the governing legislation until the Technical and Vocational Training Assistance Act (T.V.T.A. Act) of 1961-67. The

provinces reported expenditures during the six year life, of approximately two and one-half billion dollars. The Province of Alberta took good advantage of the seventy-five percent federal reimbursement, provided under this Act, by constructing the Northern Alberta Institute of Technology (NAIT) in Edmonton and by rapidly expanding the facilities of the Southern Alberta Institute of Technology (SAIT), already in existance in Calgary.

Bryce (1970:369), in his survey of the T.V.T.A. Act, indicated many curriculum decisions, made hastily in order to secure the federal funds, were less than well considered. The need for continuous review and adjustment in training curricula has been cited in many places. The Advisory Committees at NAIT exist to provide such feedback and curriculum advice.

Bible (1961:81-82), discussing advisory committees, stated that generally there was a lack of understanding among committee members as to what their job required.

Fedorak (1973:2), in his study of NAIT Advisory Committees, indicated that the members' role enactment "may be a compromise between the institute's expectations and the committee members' perceptions of their role." Clearer role definition and greater provision of information to advisory committees was recommended.

O'Connor (1965:15-75), described follow-up studies as a tool for instructional improvement. He indicated that responses to technical and vocational program surveys were

generally low, but felt that when an employer survey is combined with a follow-up of each graduate, the information obtained is much more reliable. He stated:

> Studies of this type are particularly helpful to advisory committees. When a committee has substantial data about graduates, it frequently is in a better position to recommend changes in curriculum, instruction or advisement. When the bonds of partnership between the colleges and industry are strengthened in this way, all involved benefit -- especially the student.

In the Encyclopedia of Education Research (1969:280), Robert W. Heath wrote that "In many respects, the systematic evaluation of curricula is only beginning to emerge as a recognizable field of essential research." George L. Brandon (1969:1519) commented that "Research in vocational and technical education is a recent undertaking."

Summaries of follow-up studies in Matheson (1966:21-31), Goff (1968:19-22) and Collin (1971:19-22), provided additional indications of the limited research in technical and vocational education to date.

McCracken and others provided a further summary of research studies in their federally supported work for the Centre for Vocational and Technical Education at Ohio State University. He commented (1971:83) that:

> "... although authoritative sources continually emphasize the school's responsibility for conducting job placement and student follow-up, there is a general lack of such programs."

A further review of the literature pointed to increasing activity in follow-up studies generally.

McKinney and Oglesby (1971:5-19), defined a follow-up study as "a procedure for accumulating pertinent data from, or about, individuals after they have had a similar or comparable experience." They specifically stressed, as important components of a follow-up study, the referral to all groups involved, including industry, the administration's commitment to the study and the use of a pilot group. They made many useful suggestions for anyone starting to develop a follow-up study.

Roesler (1971:8), in a five year alumni study of community colleges and technical institute students, introduced a cooperative research project for nine institutes. Varying degrees of success were reported in this voluntary project by the cooperating colleges.

Kester (1971:2-11), described the Northern California Cooperative Research Project involving twenty-two colleges, as having "put it together." It appears to be a good example of a successful cooperative study where full commitment was obtained from the individual colleges.

The Oregon State Department of Education (1972:3-10), in a feasability study, commented on how seldom industrial contact was made to verify curriculum. Their simple four-point classification system for the guidance of respondents, was as follows:

1. Absolutely should be included in the curriculum.
2. Important but could be ommitted.
3. Helpful.
4. Not needed.

The results of this study assisted them in establishing priorities among the various subjects making up the college program.

Fuller (1972:1034-1036), reported on the development of a procedural model for the collection and analysis of employment data on graduates and dropouts of vocational education programs in Vermont. Two of the objectives of the project were:

1. To develop procedures for initiating a continuing state-wide system of follow-up data collection.
2. To disseminate the results of the project so the Research Coordination Unit could assume responsibility for the continuation of the follow-up data collection and analysis system.

This study provided an excellent procedural guide for a systems approach.

The Washington State Advisory Council on Vocational Education, Olympia, Washington (1972:58-203), in a critical evaluation of that state's vocational education program, looked at the quality and adequacy of the job performance of its graduates. In the preliminaries of the study, they quoted the American Vocational Advisory Council on Vocational Education as saying that vocational education is "a multi-billion dollar, space-age enterprise directed by intuition." The council is continuing to monitor the overall state system and to assess the willingness of the system members to respond to voluntary control.

The Central Kentucky Vocational Education Evaluation

Project Final Report (1972:2-3), described development of the Kentucky system. The state board developed a complete system for evaluation, including questionnaires, documents and a procedural manual, but the system lacked local involvement throughout. They advise, as essential, the involvement of teachers, students and citizens at the local level. They stated the interests and ideas of these groups should be assessed and incorporated into any system study.

The Department of Occupational Education and Technical Education, Texas Educational Agency, Austin, Texas (1973:19-35), initiated an on-going educational product study in connection with the Southwest Development Laboratory. They stressed the need to prepare students for cooperation on surveys, to obtain forwarding addresses and to maintain an up-to-date register as means of avoiding the loss of respondents in a follow-up study.

Agreement on both the value of follow-up studies and the value of establishing curriculum relevancy by industrial surveys was reflected by the literature.

Provincially, Konrad and others (1973:1-12), outlined a systems approach for advanced education in Alberta. This approach would facilitate and coordinate follow-up studies for the total system. The Department of Advanced Education has subsequently appointed Mr. Barry Snowden as Director of Research and Planning for the province.

Locally, Kamra (1971:75-84), used a comprehensive

interview, card-sort approach to establish the relevancy of elements in the curriculum of the NAIT Chemical Technology program. Significant differences in opinion regarding the relevancy of knowledge areas were reported from the groups surveyed. Instructors, former students and their work supervisors completed a card sort for relevancy, of all items of curriculum identified by the advisory committees.

Ottley (1973:20), reported successful experience in a follow-up of NAIT Gas Technology graduates and their supervisors. He followed-up through student employers on the Advisory Committee and other employing firms identified by the placement office on campus. The correlation of students' judgement and supervisors' judgement of the importance of curricula was indicated in his study.

Bezeau (1971:10), compared instructional content with the frequency of operations required on the job. He did this by administering a paired-comparison questionnaire to automobile mechanics and supervisors. His conclusions indicated that certain tasks taught in the Alberta Automobile Apprentice Trade, such as major motor overhauls, were no longer relevant to on-the-job requirements.

Both the card sort technique employed by Kamra and the paired-comparison approach used by Bezeau, appeared to have been successful in establishing the perceived relevance of curricula. Kamra's use of multiple groups provided

more complete information for comparison. The forced choice of the paired-comparison of Bezeau held promise for identifying curriculum relevance and particularly if integrated with a student follow-up.

The measurement involved in the paired-comparison questionnaire is based on some basic concepts of measurement and quantification in psychology and education.

Thorndike and Hagen (1969:21) in an overview of measurement methods indicates that in some situations, one must depend on observation or perception for measurement. One may have to rely on the external observations of a student's teacher, his employer or the internal perceptions of the student himself for data.

Torgerson (1965:5-50), states that "in the social and behavioral sciences, we have a wealth of observations, no lack of constructs, but a rather serious shortage of important connections." He indicates that a number of procedures have been devised to determine scale values of a series of objects, events or individuals, with respect to some attribute. The procedures differ in the nature of the response obtained from the subject, the responses can be comparative or categorical.

Hays (1969:30-31), declared the most popular method for scaling a set of stimuli according to some purely psychological property, is the method of paired-comparisons and the Law of Comparative Judgement, developed by

L. L. Thurston. Suppose a number of separate and distinct objects are to be scaled on some property -- say, perceived heaviness. The objects are presented to the participant in all of the paired combinations possible. For each combination, the participant reports which member of the pair he judges to be heavier. The procedure is to place the results in a table which reflects the number of times each object, listed in the column, is perceived to be heavier than the others shown in the row.

Hays (1969:31), reported that Thurston, in order to obtain scale values for stimulus objects, assumed that each object does, in fact, have some true scale position in terms of the psychological characteristic under study. In the example given, this was heaviness. However, he also assumed that at the moment of judgement, there may have been a certain amount of error or deviation from the true position. Furthermore, he assumed that the error values for any given stimulus were normally distributed with a mean of zero and a normal curve distribution. Thurstone called this concept of a distribution of values about some central, true value of the stimulus, a discriminal dispersion. He based the assumption that the distribution of errors should be normal, on the well-known principle that errors, due to the combination of large numbers, tend to be distributed in this way.

The application of information derived from the review

of the related literature on paired-comparisons, appears in the design sections of Chapter III, the pilot study, and Chapter IV, the study itself. The stimulus pairs employed in the study were the areas of knowledge and skill in the OMT curricula. The raw data obtained was the participant's perception of the relevancy of those areas to the office machine technicians' requirements on the job. The individual responses were tabulated to provide the scale values of perceived relevance for each curriculum area by the three responding groups.

The methods and ideas from this review of the literature, led to the formulation of this study, starting with the construction of the original paired-comparison questionnaire for the pilot study. The pilot study is reported in detail in Chapter III.

CHAPTER III

The Pilot Study

This chapter deals exclusively with the pilot study undertaken to ascertain the feasibility of using a specially prepared, paired-comparison questionnaire on OMT curriculum components, with multiple groups of respondents. The panel of respondents involved consisted of: two instructors, two service managers, two students and two office machine dealership managers.

Panel Selection

There had only been two instructors involved in the NAIT OMT program, and both instructors were included on the panel.

One service manager was selected to represent a national manufacturer of office quipment; the other to represent an independent local dealership.

The students were selected from names provided by the instructors, to represent either a national or local company. A substitution became necessary in one instance as the student left his employer after his name was suggested.

Each dealership manager was also selected to represent one of the two segments of the industry. Both, men who

had contributed significantly to the OMT Advisory Committee, and were willing to participate in the study.

All panel members were knowledgeable about the program. The operations of the firms involved were deemed sufficiently diversified to provide the type of backgrounds necessary for evaluation of the ten knowledge and the ten skill areas proposed for investigation.

Knowledge and Skill Areas

A review of the NAIT program, as outlined in the 1974/75 calendar, was made with the two instructors. Seven basic areas of knowledge and nine skill areas were identified. To these areas were added: record keeping, which had been dropped from the program; electronic theory; salesmanship; and organizational behavior. The latter three had been suggested as possible areas of study by the OMT Advisory Committee. In this manner, ten areas of knowledge and ten skill areas were identified and the preliminary survey instrument prepared. Definitions or descriptions of the areas of study were taken from the OMT calendar listing, with the exception of the four areas mentioned above. The description for record keeping was composed of items listed by the Advisory Committee as the kind of records that they wanted employees to be able to keep, rather than the original bookkeeping course, previously dropped from the curriculum. The description for the sales course was taken from the NAIT

Business Administration calendar and qualified as directly applied to office machines. The description of the organizational behavior course was also taken from the Business Administration calendar. The description for electronic theory was taken from the NAIT Radio, T.V. Repair calendar description of electronic theory. These descriptions of the twenty elements of the curriculum deemed by the instructors as most essential, were selected as the stimuli for the questionnaire.

Survey Format

The type of format of the instrument, selected for use in the questionnaire was the "paired-comparison" and "forced choice" pattern, which requires the participants to choose between two areas of knowledge. The ten areas were each paired once, forcing a choice and, thereby, the establishment of priorities by the participant. The particular format used by Manuel (1972) was selected, as it avoided the double-column, heavy-appearing, complex questionnaire so often used. A random approach to pairing was used throughout the questionnaire.

A copy of the original instrument used for the pilot study, including the covering letters to the panel members and the introductions to Sections A and B, appears in Appendix A. The introductions for each group; students, instructors, service managers and dealership managers, are

included, but the complete questionnaire is provided only once, with the students' introduction. The background for comparative judgements has been given in the literature review in Chapter II. Further elaboration is provided in Chapter IV, which provides a description of the final questionnaire.

Pilot Study Design

The pilot study was designed as a follow-up study of students' perception of the importance of knowledge and skill areas. The areas were selected from the curriculum by the author and OMT instructors and from recommendations for curriculum changes made by the OMT Advisory Committee. The specially designed questionnaire outlined above, was administered to the two instructors, two service managers and two dealership managers, in addition to the two students. Feedback from the three auxillary groups, in addition to that from the normal group was employed to allow cross-comparison of scale values obtained.

The survey population was divided into two groups for the purpose of dealership classification comparisons. Group 1 consisted of a senior instructor, a student, a service manager and a dealership manager employed by a national manufacturer. Group 2 consisted of another student, a service manager and a dealership manager from the smaller local dealership.

Grouping of the participants in the pilot study is listed in Appendix B.

Procedure

The involvement of the instructors in preparing the knowledge and skill areas was discussed earlier. It cannot be over-stressed that a researcher doing curriculum validation must first obtain the cooperation of the teachers or line people involved with the curriculum. This is particularly true where approval in principle is granted by the administration. The program taught by the line staff may well be affected and they may feel threatened by the evaluation.

Random pairing of areas was maintained throughout, but a record of the pairings was kept to avoid searching for duplications. The record of pairings was later double-checked when a Fortran Coding Form was prepared for computer processing. This avoided program problems.

After sorting the questionnaires into two groups, the responses were fed into the computer by terminal. The University of Alberta, Division of Educational Research Assistance, provided the computer program and assistance.

Analysis of Pilot Data

It was discovered that the design of the study for

cross-comparison of dealership classifications, had been violated. The design to select panel members so that a local dealership could be compared with the staff of a national dealership, was negated in implementation. Experimental mortality had occurred even with so small a sample. One dealer was on vacation, one service manager had retired, and substitutions had to be made. The final groupings, as listed in Appendix B, did permit the comparison of respondent classifications and illustrated the capability of the computer program to handle such comparisons.

Table 1 indicates the choices made and the number of times an area of knowledge or skill was preferred over the other nine areas. This was of interest because of the blank cells that appeared in columns six, nine, and ten. These areas reflected an area of knowledge that was never preferred over others. This occurred with the small sample and it pointed out the problem of comparing the evaluations of only two instructors, even though they represented 100 per cent of the sample available.

TABLE 1

Pilot Study - Knowledge Areas

Number of Times J is Preferred to I

	J =	1	2	3	4	5	6	7	8	9	10
I =	1	*	3	3	1	1	0	1	1	0	0
	2	5	*	5	1	2	2	2	4	0	0
	3	5	3	*	2	3	1	3	3	1	1
	4	7	6	6	*	6	4	4	6	3	3
	5	7	6	5	2	*	2	3	6	2	1
	6	8	6	7	4	6	*	5	5	3	2
	7	7	6	5	4	5	3	*	5	3	1
	8	7	4	5	2	2	3	3	*	1	1
	9	8	8	7	5	6	5	5	7	*	1
	10	8	8	7	5	7	6	7	7	7	*

The scale values produced in Table 2 using zero as the central point arbitrarily assigned, and a standard deviation of one, indicated quite clearly the cumulative evaluation of the eight people involved. Trade mathematics, communication theory, sales, record keeping and physical and leisure education displayed a negative variation and were considered least important. Organizational behavior, machine shop, electrical theory, electronic theory and typewriter theory were positively scaled in ascending order. Of particular interest in the scale values, was the placement of electronic theory above electrical theory in perceived importance.

TABLE 2

Pilot Study - Knowledge
(n=8)

Stimulus No.	Scale Values	Areas
10	-1.822	Physical and Leisure Education
9	-0.908	Record Keeping
4	-0.669	Sales
6	-0.606	Communications Theory
7	-0.188	Trade Mathematics
5	0.120	Organizational Behavior
8	0.515	Machine Shop
2	0.857	Electrical Theory
3	0.932	Electronic Theory
1	1.768	Typewriter Theory

Section B of the original questionnaire regarding skills was suspected of being superfluous because of the similarity of the skills to the corresponding knowledge areas. It was decided to keep this section in the questionnaire when the scale values, illustrated in Table 3, revealed that typewriter adjustments and electrical repairs both received higher scale values than electronic component replacement. Section B's "skills", obviously provided a valid comparison with Section A's "knowledge areas."

TABLE 3

Pilot Study - Skills

Stimulus No.	Scale Values	Areas
7	-2.409	Typing Skill
9	-0.869	Salesmanship
10	-0.656	Calculations and Records
8	0.133	Communications Skill
6	0.338	Electrical Component Replacement
3	0.409	Electronic Repair
4	0.486	Electronic Component Replacement
2	0.512	Electrical Repairs
1	0.809	Typewriter Adjustments
5	1.247	Typewriter Component Replacement

Table 4 records the scale values obtained from the first four respondents identified as Group 1. The scale values from respondents five to eight, identified as Group 2, are recorded in Table 5. Although of little value statistically, the tables indicated the computer program's ability to compare total group evaluations. Therefore, the responses of groups such as service managers could be compared with those of students, as proposed and indicated in the pilot study design.

TABLE 4

Pilot Study Group 1 Knowledge

Stimulus No.	Scale Values	Areas
10	-1.690	Physical and Leisure Education
9	-1.455	Record Keeping
4	-0.280	Sales
7	-0.280	Trade Mathematics
6	-0.280	Communications Theory
5	-0.045	Organizational Behavior
8	0.268	Machine Shop
2	1.254	Electrical Theory
3	1.254	Electronic Theory
1	1.254	Typewriter Theory

TABLE 5

Pilot Study Group 2 Knowledge

Stimulus No.	Scale Values	Areas
10	-1.666	Physical and Leisure Education
6	-0.936	Communications Theory
4	-0.754	Sales
9	-0.693	Record Keeping
7	-0.337	Trade Mathematics
3	0.474	Electronic Theory

TABLE 5 (Continued)

Stimulus No.	Scale Values	Areas
2	0.474	Electrical Theory
5	0.683	Organizational Behavior
8	0.891	Machine Shop
1	1.864	Typewriter Theory

The ranking of skills by the first group of four respondents is represented in Table 6. The presence of blank cells in group two, prevented any meaningful comparison, again reinforcing the value of a pilot study to operationally test the proposed comparisons.

A final run was attempted with the responses of the two instructors, but as the blank cells involved prevented meaningful analysis, the terminal print out was interrupted by the operator and not completed.

TABLE 6

Pilot Study Group 1 (n=4) Skills

Stimulus No.	Scale Values	Areas
7	-2.398	Typing Skill
9	-0.539	Salesmanship
10	-0.539	Calculations and Records
8	-0.534	Communications Skill

TABLE 6 (Continued)

Stimulus No.	Scale Values	Areas
2	0.205	Electrical Repairs
6	0.470	Electrical Component Replacement
4	0.470	Electronic Component Replacement
5	0.802	Typewriter Component Replacement
1	0.802	Typewriter Adjustments
3	1.267	Electronic Repair

The occurance of blank cells in the preference matrices in the pilot study results was a problem. The problem was particularly apparent in the tabulation of instructor preferences which appears in Table 7.

The computer program's capacity to tabulate complete scale values was tested and proven by the computer print-outs. Copies of the computer print-out Graph of Scale Values appear in Figures I and II.

TABLE 7

Schedule of Instructor Preferences

Pilot Study - Knowledge

Number of Times J is Preferred to I

	J =	1	2	3	4	5	6	7	8	9	10
I =	1	*	0	0	0	0	0	0	0	0	0
	2	2	*	1	0	1	0	1	2	0	0
	3	2	1	*	1	1	0	1	2	0	0
	4	2	2	1	*	1	0	1	2	0	0
	5	2	1	1	1	*	1	1	2	1	0
	6	2	2	2	2	1	*	2	2	1	0
	7	2	1	1	1	1	0	*	1	0	0
	8	2	0	0	0	0	0	1	*	0	0
	9	2	2	2	2	1	1	2	2	*	0
	10	2	2	2	2	2	2	2	2	2	*

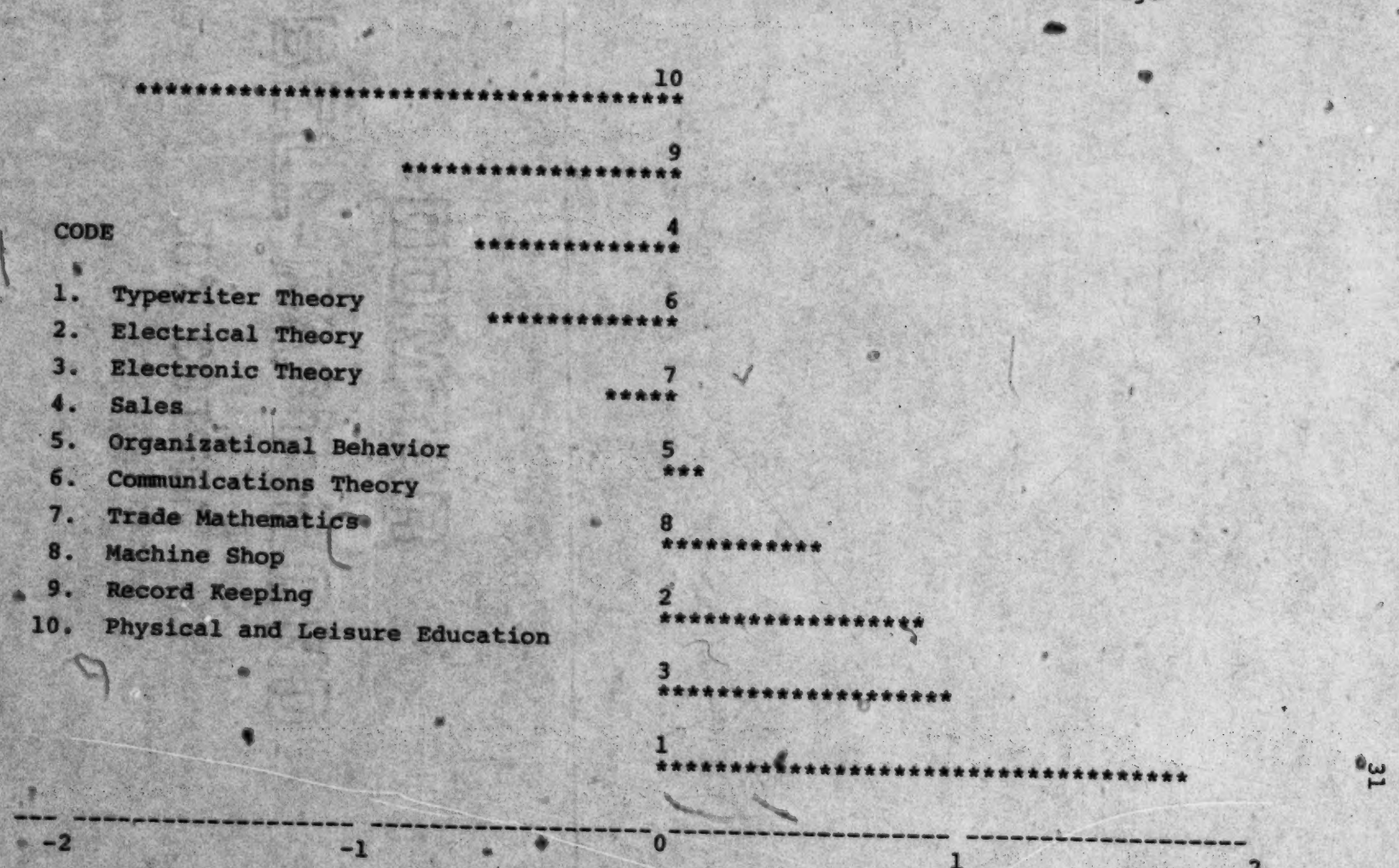
Pilot Study Summation

The capability of producing meaningful and useful data by means of a paired-comparison questionnaire and the Division of Educational Research Assistance Computer Program was established by the means of the pilot study. Revision of proposals regarding comparison of instructor responses and therefore, of the original hypotheses was necessary. The strong recommendation for pilot studies found in the review of the literature appeared justified by the problems encountered in conducting this preliminary study.

PILOT STUDY

GRAPH OF SCALE VALUES

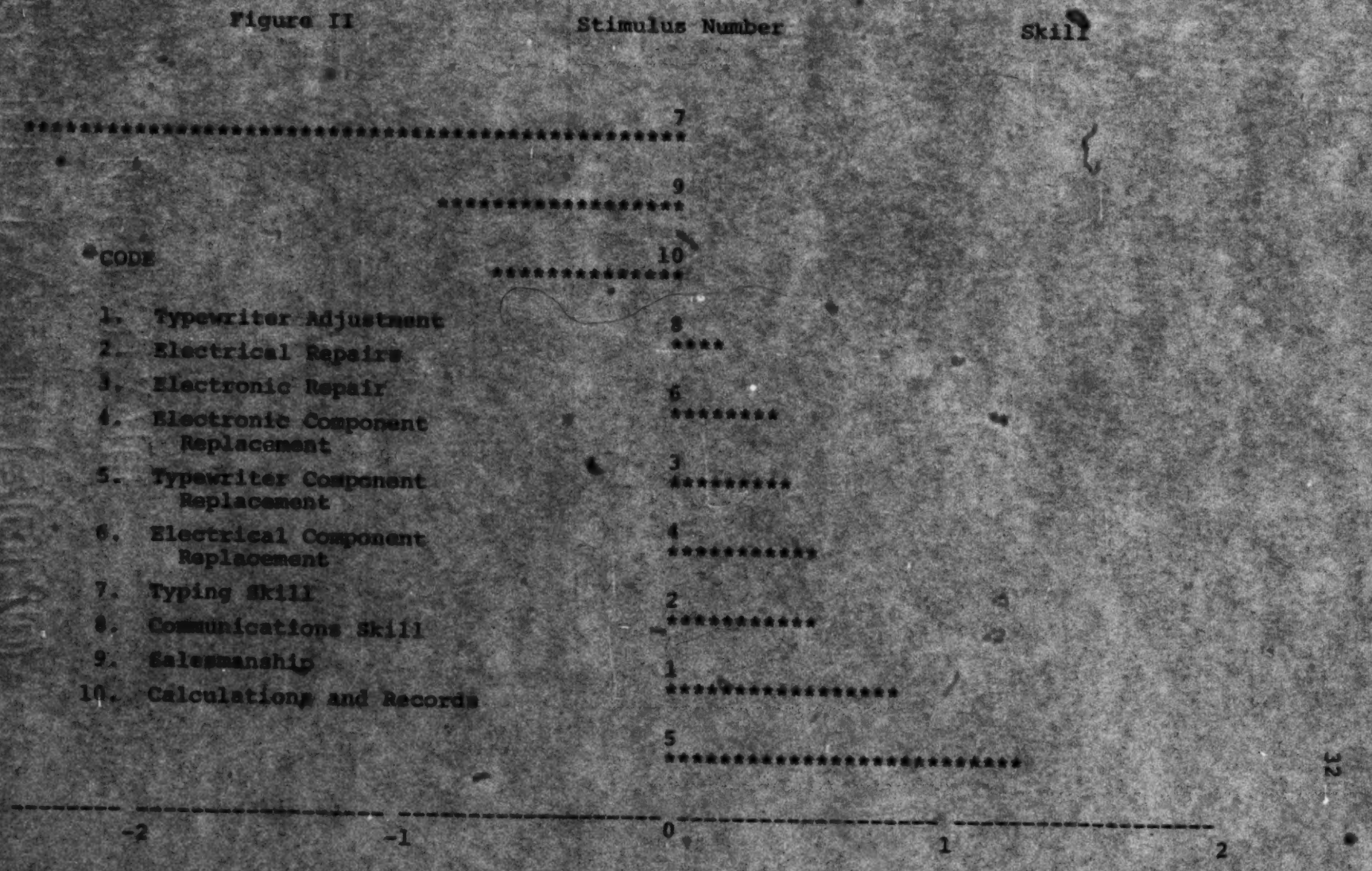
Figure I



PILOT STUDY

GRAPH OF SCALE VALUES

Figure II



CHAPTER IV

The Study

This chapter reports the design of the study, the instrument used, the populations to whom the instrument was administered and the procedure employed.

The Design

The design was a descriptive study of the NAIT Office Machine Technician (OMT) program. The curriculum relevancy was examined by obtaining the perceptions of former students and the perceptions of service managers and dealership managers from Edmonton and area office machine dealerships. The respondents' perceptions of the relative importance of the knowledge and skill areas of the curriculum to what is required on the job by the technician, were sought. The data was obtained by means of a specially constructed paired-comparison questionnaire, tested in the pilot study described in Chapter III.

The Questionnaire

The same questionnaire was used as in the pilot study, although the instructions for students were made more

specific. This was done following a suggestion made by one of the pilot panel, in a personal interview conducted after the pilot study results were reported to the participants.

The compared areas of knowledge or skills act as the stimulus for the discriminal process of the observer or participant. To present each comparison or stimulus once, and only once, required forty-five questions for the ten knowledge areas and forty-five comparisons or questions for the ten skills. The discriminations were based on what the respondent felt was the most important area of knowledge, for him if he was a student, for his servicemen if he was a service manager, or for his service employees if he was a dealership manager. A frequency distribution was then generated by recording which of the two items was chosen. The number of times a knowledge area or skill area was preferred was calculated, and from this a matrix of proportions. A scale value for each area or item of curriculum was generated showing the negative or positive deviation from zero, which was declared as the central point.

Populations

The student population was selected to include all the students who had completed the one year program, from 1964 to 1974, rather than just the graduates. The rationale

for this selection was that the graduates might present a biased sample since some students who had completed the program, but did not graduate due to deficiencies, did obtain work. There was one noticeable example in the follow-up. A non-graduate, who complained of marking bias at NAIT had scored high on company training programs and had been successful in the field. The early drop-outs were not included, but all who finished the second quarter and entered the last quarter were included. One hundred sixteen students were sent questionnaires and thirty-nine responded. Many of the recorded addresses were for boarding houses rather than permanent home addresses. This was particularly true for the years prior to 1969.

The industry sample was selected from the Yellow Pages of the Edmonton and District Telephone Directory. Thirty-two dealers listed under Typewriters, Office Equipment, Business Machines, Calculators and Electronic Calculators, were sent a preliminary letter requesting their participation. Two dealers indicated their business involved sales only and not the servicing of machines. One had a part-time operation and asked to be excluded. All others either indicated their interest in participating in the study or by non-response accepted mailing of the questionnaire. Thirty questionnaires were sent to service managers and thirty to dealership managers. Thirteen

service managers and eleven dealership managers responded. The dealership list, covering letter and some replies are included in Appendix C.

Procedure

The members of the Advisory Committee included in the comprehensive sample all received personal telephone calls to advise them the questionnaire was being placed in the mail as it was anticipated they would be expected to be fully informed on any aspect of the study. They would then be able to answer any questions from other members of the industry who were not active on the Advisory Committee.

A follow-up was made one week after mailing to confirm receipt of the questionnaire, solicit any questions, and request completion and return. The questionnaires were all numbered on the last page so those who had returned the questionnaire could be eliminated from the follow-up procedure. All dealerships not responding received follow-up telephone calls.

The student questionnaires were similarly coded to permit personal follow-up. Although a one-week return was requested, returns were low and approximately two weeks were allowed before telephone calls were made to those in the city. A follow-up letter was sent to those confirmed to be living out of the city.

All original letters were sent as printed matter, but marked "please forward". The follow-up letter appears in Appendix C, and was sent first class mail. The procedure on follow-up was to tick off questionnaires as received and to follow all those remaining by checking the telephone directory. In most cases, permanent addresses were not available and the addresses proved to be suites or apartments near NAIT. The Henderson's City Directory was used to obtain the name of the landlord, and calls were made requesting information on the former tenant. This was done only after checking the student's name in Henderson's and searching for a record of the student's employment in the office machine field.

The final data was key punched by the Division of Educational Research Assistance and processed by the Computing Services of the University of Alberta. Computer print outs provided the complete analysis of results reported in Chapter V.

CHAPTER V

Results

Introduction

This chapter reports the results and analysis of data as proposed in Chapter I. The scale values for each of the three responding groups; students, service managers and dealership managers are reported under the following categories:

Section 1. Knowledge Areas

Section 2. Skill Areas

Section 3. Combined Knowledge and Skill Areas. Areas that are related.

In addition, total sample scale values, reflecting the responses of all responding groups for each area of curriculum, are reported under the following categories:

Section 4. Knowledge - Total Sample

Section 5. Skills - Total Sample

Section 6. Combined Knowledge, Skill - Total Sample. Areas that are related.

Analysis

The responses to the questionnaire, based on Thurston's matched-pairs, produced a frequency distri-

bution for the selections of each area of knowledge or skill. A matrix of proportions was derived and yielded a value assigned by the interest of the respondent in that area of curriculum.

With a central point of zero, arbitrarily assigned, and a standard deviation of one, scale values were generated for each area of curriculum. There were ten areas of knowledge and ten areas of skill identified, as discussed in Chapter III. Values for each area of curriculum were produced for each of the three responding groups; students, service managers and dealership managers.

Therefore, scale values were available for each individual area of knowledge or skill for comparison with the results obtained for each of the groups, plus cumulative scale value obtained from all of the respondents.

The scale values reflected only that a particular responding group, whether students, service managers, dealership managers or all respondents together, assigned a particular rating to a specific area of knowledge or skill. Scale values were consequently considered as follows:

Scale values near zero reflected a middle or average rating of importance of the individual knowledge or skill area.

Scale values zero to plus one, reflected increasing importance assigned to that area of curriculum reported.

Scale values zero to minus one, reflected decreasing importance attached to the specific area of knowledge or skill reported.

Scale values exceeding plus one or minus one, were, as in the consideration of normal curve distributions, considered very highly rated in importance, if positive and very lowly rated in importance, if negative.

In the sections and tables that follow, the scale values of curriculum areas are presented in ascending order from the lowest negative to the highest positive value recorded.

Section 1. Knowledge Areas

Knowledge - Students

The rating of knowledge areas by students is reflected in Table 8. Their rating of physical and leisure education at -1.576 was consistent with the results of the pilot study and consistent with the ratings of both the service managers and the dealership managers.

Record keeping, although considered only as keeping the minimal records suggested by the Advisory Committee, was given a very low rating by the students at -1.191, also exceeding the standard deviation of minus one.

Organizational behavior at -0.614, sales at -0.334 and communications theory at -0.183, although below the central point, received increasing valuations of importance.

Machine shop, at 0.866 and electronic theory at 0.941, were above the central point and strongly rated areas.

Typewriter theory at 1.233, received a very high rating of importance by the students, exceeding the standard deviation. Electrical theory at 1.442, was given the highest rating by the students.

TABLE 8

Knowledge - Students
(n-39)

Stimulus No.	Scale Values	Areas
10	-1.576	Physical and Leisure Education
9	-1.191	Record Keeping
7	-0.584	Trade Mathematics
5	-0.614	Organizational Behavior
4	-0.334	Sales
6	-0.183	Communications Theory
8	0.866	Machine Shop
3	0.941	Electronic Theory
1	1.233	Typewriter Theory
2	1.442	Electrical Theory

Knowledge - Service Managers

Again, as indicated in Table 9, physical and leisure education at -1.425, received the lowest rating, exceeding the negative standard deviation of one. Sales at -1.229, also reflected a very low value by the service managers.

Trade mathematics at -0.962, communications theory at -0.327 and record keeping at -0.216, were all within the negative standard deviation, in order of increasing acceptance or importance.

Table 9 also reflected the positive evaluation of machine shop at 0.044 and organizational behavior at 0.219, within the positive standard deviation of one.

Electrical theory at 1.063 and typewriter theory at 1.109, reflected a high evaluation by the service managers. This was also indicated in the student's results.

Again, as in the pilot study, the highest evaluation was of electronic theory at 1.723. This was reflected in the service managers' rating, as they also rated electronic theory as the most important knowledge area.

TABLE 9

Knowledge - Service Managers

(n=13)

Stimulus No.	Scale Value	Areas
10	-1.425	Physical and Leisure Education
4	-1.229	Sales
7	-0.962	Trade Mathematics
6	-0.327	Communications Theory
9	-0.216	Record Keeping
8	0.044	Machine Shop
5	0.219	Organizational Behavior
2	1.063	Electrical Theory
1	1.109	Typewriter Theory
3	1.723	Electronic Theory

Knowledge - Dealership Managers

Physical and leisure education at -1.686, was again of questionable importance, as shown in Table 10, exceeding the negative standard deviation of one, by .686.

Communications theory at -0.916, trade mathematics at -0.811, sales at -0.543 and record keeping at -0.296, were all listed negatively, but within the standard deviation. Record keeping, in this instance, approached the centre-point assigned of zero.

The dealership ratings placed organizational behavior at 0.124, just within the positive ranking, to join machine shop at 0.263, as an area of knowledge considered important.

Typewriter theory at 1.045, electrical theory at 1.162 and electronic theory at 1.659, were all considered very important by the dealership managers, as shown by their scale values exceeding one.

TABLE 10

Knowledge - Dealership Managers

(n=11)

Stimulus No.	Scale Value	Areas
10	-1.686	Physical and Leisure Education
6	-0.916	Communications Theory
7	-0.811	Trade Mathematics
4	-0.543	Sales
9	-0.296	Record Keeping
5	0.124	Organizational Behavior
8	0.263	Machine Shop
1	1.045	Typewriter Theory
2	1.162	Electrical Theory
3	1.659	Electronic Theory

Section 2. Skill Areas

Skills - Students

Typing was considered very unimportant, approaching almost twice the standard deviation at -1.879, as shown in Table 11.

Calculation and records skill was also very unimportant to the students, at -1.109.

Salesmanship at -0.767 and communications skill at -0.633, showed negative ratings, but within the standard deviation of one.

Electronic component replacement at 0.296 and electrical component replacement at 0.339 and electronic repair at 0.471, were all rated important by the students. Typewriter component replacement fitted this category, but at 0.742, reflected much greater acceptance.

Electrical repairs at 1.115 and typewriter adjustment at 1.425, were placed in the highest importance range, exceeding the standard deviation of one by .115 and .425, respectively.

TABLE 11

Skills - Students

(n=39)

Stimulus No.	Scale Value	Areas
7	-1.879	Typing Skill

TABLE 11 (continued)

(n=39)

Stimulus No.	Scale Value	Areas
10	-1.109	Calculations and Records
9	-0.767	Salesmanship
8	-0.633	Communications Skill
4	0.296	Electronic Component Replacement
6	0.339	Electrical Component Replacement
3	0.471	Electronic Repair
5	0.742	Typewriter Component Replacement
2	1.115	Electrical Repairs
1	1.425	Typewriter Adjustment

Skills - Service Managers

Typing at -2.089, was rated very unimportant by the service managers, as it was by the students. Salesmanship was also rated very unimportant at -1.053, as shown in Table 12.

Calculation and records skill at -0.704 and communications skill at -0.392, were rated in the unimportant range, but were within the standard deviation.

Electronic repair and typewriter component replacement were both in the medium importance range and showed increasing positive ratings at 0.202 and 0.291, respectively.

Electrical component replacement and electrical repairs reflected positive importance ratings of greater range at 0.731 and 0.751. Electronic component replacement reflected a strong evaluation by the service managers at 0.913.

Typewriter adjustment skill stood alone, as very important; the skill most required by the service manager, exceeding the standard deviation at 1.350.

TABLE 12

Skills - Service Managers

(n=13)

Stimulus No.	Scale Value	Areas
7	-2.089	Typing Skill
9	-1.053	Salesmanship
10	-0.704	Calculations and Records
8	-0.392	Communications Skill
3	0.202	Electronic Repair
5	0.291	Typewriter Component Replacement
6	0.731	Electrical Component Replacement
2	0.751	Electrical Repairs
4	0.913	Electronic Component Replacement
1	1.350	Typewriter Adjustments

Skills - Dealership Managers

The dealership managers' low evaluation of typing as a very unnecessary skill for an office machine technician, was shown by a negative rating exceeding two standard deviations at -2.134. The scale values appear in Table 13.

Calculation and records skill together with salesmanship received a low priority from dealership managers at -0.787 and -0.750, respectively.

Communications skill and skill in typewriter component replacement showed importance, but in the negative range at -0.249 and -0.207. Electrical component replacement was in the positive range, at 0.250.

Electrical repairs was positively rated and stood alone in the 0.657 range of importance.

Electronic component replacement and typewriter adjustments were evaluated at 0.839 and 0.937, respectively, indicating they were considered very important.

Electronic repair was rated by the dealership managers as the most important skill and exceeded the standard deviation by .444 at a scale value of 1.444. This was in contrast to the service managers' much lower rating of 0.202.

TABLE 13

Skills - Dealership Managers

(n=11)

Stimulus No.	Scale Value	Areas
7	-2.134	Typing Skill
10	-0.787	Calculations and Records
9	-0.750	Salesmanship
8	-0.249	Communications Skill
5	-0.207	Typewriter Component Replacement
6	0.250	Electrical Component Replacement
2	0.657	Electrical Repairs
4	0.839	Electronic Component Replacement
1	0.937	Typewriter Adjustments
3	1.444	Electronic Repair

Section 3. Combined Tables

Combined Table - Students

Table 14 represents the combined Knowledge and Skill Tables for the students. Record keeping knowledge and calculations and records skills, showed values of -1.191 and -1.109, indicating a consistent evaluation of the unimportance of this area of knowledge and skill.

Trade mathematics at -0.584, was given some importance, but this was still a low rating of importance.

Knowledge of organizational behavior at -0.614 and sales at -0.334, were the low rankings of importance assigned. Salesmanship skill at -0.767, was rated even lower in importance.

Communications skill was negative at -0.633, compared to communications theory at -0.183, but both scale values were indications of the low importance attached by students to this area.

Electronic component replacement at 0.296 and electrical component replacement at 0.339, were assigned similar ratings by the students at 0.339, indicating positive acceptance.

Typewriter component replacement skill, at 0.742 and machine shop knowledge at 0.866, were both strongly positive and represented strong importance to the students. Electronic theory enjoyed an even stronger evaluation at 0.941.

Typewriter theory at 1.233 and electrical theroy at 1.442 and typewriter adjustment at 1.425, reflected the very strong importance of the typewriter training as seen by the students.

TABLE 14

Combined Table - Students

Knowledge

(n=39)

Stimulus No.	Scale Value	Area
10	-1.576	Physical and Leisure Education
9	-1.191	Record Keeping
7	-0.584	Trade Mathematics
5	-0.614	Organizational Behavior
4	-0.334	Sales
6	-0.183	Communications Theory
8	0.866	Machine Shop
3	0.941	Electronic Theory
1	1.233	Typewriter Theory
2	1.442	Electrical Theory

Skills

7	-1.879	Typing Skill
10	-1.109	Calculations and Records
9	-0.767	Salesmanship
8	-0.633	Communications Skill
4	0.296	Electronic Component Replacement
6	0.339	Electrical Component Replacement
3	0.471	Electronic Repair
5	0.742	Typewriter Component Replacement
2	1.115	Electrical Repairs
1	1.425	Typewriter Adjustments

Combined Tables - Service Managers

Table 15 is the combined tables for the service managers. Physical and leisure education at -1.425, typing skill at -2.089, sales knowledge at -1.229 and salesmanship at -1.053, were of doubtful importance to the service managers, as they showed a negative deviation greater than one.

Trade mathematics at -0.962 and calculations and records skill at -0.704, were negatively rated, but came within the lower range of a standard deviation of one. Record keeping knowledge at -0.216, was rated slightly higher, but communications theory at -0.327 and communications skill at -0.392, were both rated less important.

Machine shop at 0.044, fell almost at the centre-point or average of the scale values reflected by the service managers.

Organizational behavior at 0.219, electronic repair at 0.202, and typewriter component replacement, were all considered important.

Electrical component replacement at 0.731, electrical repairs at 0.751 and electronic component replacement at 0.913, were highly ranked skills.

As in the students' results, electrical theory at 1.063, typewriter theory at 1.109 and typewriter

adjustments at 1.350, indicated very strong importance.

At 1.723, electronic theory was the most highly rated area of knowledge or skill.

TABLE 15

Combined Table - Service Managers

Knowledge

(n=13)

Stimulus No.	Scale Value	Areas
10	-1.425	Physical and Leisure Education
4	-1.229	Sales
7	-0.962	Trade Mathematics
6	-0.327	Communications Theory
9	-0.216	Record Keeping
8	0.044	Machine Shop
5	0.219	Organizational Behavior
2	1.063	Electrical Theory
1	1.109	Typewriter Theory
3	1.723	Electronic Theory

Skills

7	-2.089	Typing Skill
9	-1.053	Salesmanship
10	-0.704	Calculations and Records
8	-0.392	Communications Skill
3	0.202	Electronic Repair
5	0.291	Typewriter Component Replacement

Table 15 (continued)

Combined Table - Service Managers

Skills

Stimulus No.	Scale Value	Areas
6	0.731	Electrical Component Replacement
2	0.751	Electrical Repair
4	0.913	Electronic Component Replacement
1	1.350	Typewriter Adjustments

Combined Tables - Dealership Managers

Table 16 is the combined tables for dealership managers. Again, as in the student and service manager results, the dealership managers' low ratings of physical and leisure education at -1.686 and typing skill at -2.134, exceeded the negative standard deviation of one. This indicated the areas were considered very unimportant.

Communications theory was very unimportant, at -0.916, although communications skill results showed a more acceptable rating of -0.249.

Dealership managers also showed very little importance for trade mathematics at -0.811, and calculations and records skill at -0.787, but rated record

keeping knowledge higher, at -0.296.

Salesmanship, at -0.750 and sales knowledge at -0.543, were both rated quite low by the dealership managers, but electronic repair, at 1.444, was rated the most important skill.

Organizational behavior at 0.124 and machine shop at 0.263, were both moderately rated, but typewriter component replacement was even lower at a rating below the mid-point, at -0.207.

Some acceptance of electrical component replacement was indicated with a rating at 0.250, electrical repairs at 0.657 and electronic component replacement at 0.839.

As with the students and service managers, typewriter theory at 1.045, electrical theory at 1.162 and typewriter adjustments at 0.937, showed very important results, near the positive standard deviation of one, indicating the typewriter instruction importance.

Dealership managers' results also placed electronic theory highest, at 1.659, as did the service managers.

TABLE 16

Combined Table - Dealership Managers

Knowledge

(n=11)

Stimulus No.	Scale Value	Areas
10	-1.686	Physical and Leisure Education
6	-0.916	Communications Theory
7	-0.811	Trade Mathematics
4	-0.543	Sales
9	-0.296	Record Keeping
5	0.124	Organizational Behavior
8	0.263	Machine Shop
1	1.045	Typewriter Theory
2	1.162	Electrical Theory
3	1.659	Electronic Theory

Skills

7	-2.134	Typing Skill
9	-0.787	Calculations and Records
10	-0.750	Salesmanship
8	-0.249	Communications Skill
5	-0.207	Typewriter Component Replacement
6	0.250	Electrical Component Replacement
2	0.657	Electrical Repairs
4	0.839	Electronic Component Replacement
1	0.937	Typewriter Adjustments
3	1.444	Electronic Repair

Section 4. Knowledge - Total Sample

Students, Service Managers, Dealership Managers
Cumulative Knowledge - Total Sample

As previously indicated by individual results for students, service managers and dealership managers, the cumulative or combined results, Table 17, reflected universal evaluation of physical and leisure education at -1.679, well below the negative standard deviation of one.

Record keeping at -0.797 and trade mathematics at -0.721, fell within the standard deviation and were rated as very unimportant areas of knowledge.

Sales, at -0.614, was also quite poorly rated. Communications theory at -0.386 and organizational behavior at -0.276, were rated higher, but still fell within the negative standard deviation.

Machine shop at 0.564, fell very close to the arbitrarily assigned centre-point of zero and appeared of average importance.

As evidenced in the individual results, typewriter theory at 1.208 and electrical theory at 1.376, were the important areas of knowledge. Also included in this group, was electronic theory at 1.324. It was noted that electronic theory results were lower than electrical theory in the cumulative results.

TABLE 17

Knowledge - Total Sample

(n=63)

Stimulus No.	Scale Value	Areas
10	-1.679	Physical and Leisure Education
9	-0.797	Record Keeping
7	-0.721	Trade Mathematics
4	-0.614	Sales
6	-0.386	Communications Theory
5	-0.276	Organizational Behavior
8	0.564	Machine Shop
1	1.208	Typewriter Theory
3	1.324	Electronic Theory
2	1.376	Electrical Theory

Section 5. Skill - Total Sample

Students, Service Managers, Dealership Managers

Cumulative Skill - Total Sample

The cumulative results, Table 18, indicated the lowest importance of typing skill at -2.050, over twice the standard deviation.

Calculations and records at -0.930, showed less than the standard deviation in the cumulative results for a very low evaluation of importance.

Salesmanship at -0.832 was not considered very important and although it rated higher than communications skill at -0.552, both were still below the centre-point of zero.

Electrical component replacement at 0.434 and typewriter component replacement at 0.438, reflected greater importance. Electronic component replacement at 0.510 and electronic repair at 0.591, received stronger evaluations as important skill areas.

Electrical repairs at 0.984 and typewriter adjustments at 1.406, achieved the highest ratings on the cumulative results.

TABLE 18

Skills - Total Sample

(n=63)

Stimulus No.	Scale Value	Areas
7	-2.050	Typing Skill
10	-0.930	Calculations and Records
9	-0.832	Salesmanship
8	-0.552	Communications Skill
6	0.434	Electrical Component Replacement
5	0.438	Typewriter Component Replacement
4	0.510	Electronic Component Replacement

Table 18 (continued)

Skills - Total Sample

Stimulus No.	Scale Value	Areas
3	0.591	Electronic Repair
2	0.984	Electrical Repairs
1	1.406	Typewriter Adjustments

Section 6. Knowledge, Skill - Total Samples

Students, Service Managers, Dealership Managers

Knowledge, Skill - Total Samples

The expected unimportance of typing skill in the cumulative results was indicated by its rating of -2.050. Physical and leisure education at -1.679, was the lowest ranked knowledge area, indicated in Table 19.

Calculation and records skill was expected to be lower in the cumulative results and was very poorly rated at -0.930, the second lowest skill area Record keeping at -0.797 and trade mathematics at -0.721, were the next lowest areas.

Salesmanship at -0.832, was rated very low as a required skill and this is partially reflected by sales knowledge at -0.614, fourth lowest of the knowledge areas.

Communications skill at -0.552 and communications theory at -0.386, reflected similarly low preference in the Total Sample Tables. Organizational behavior was rated higher at -0.276, but still below the centre-point in importance.

Electrical component replacement at 0.434, typewriter component replacement at 0.438, electronic component replacement at 0.510, machine shop at 0.564 and electronic repair at 0.591, were all rated important.

The ratings for electrical repairs at 0.984, typewriter theory at 1.208, electronic theory at 1.324 and electrical theory at 1.376, reflected very positive endorsement in the total sample evaluation, with the latter three exceeding the standard deviation.

Typewriter adjustments remained the highest rated area of skill or knowledge at 1.406, almost half again the standard deviation.

The graphs of scale values for Knowledge - Total Sample and for Skill - Total Sample, appear in Figures III and IV.

TABLE 19

Knowledge,Total Sample - Skills,Total Sample

Knowledge - Total Sample

(n=63)

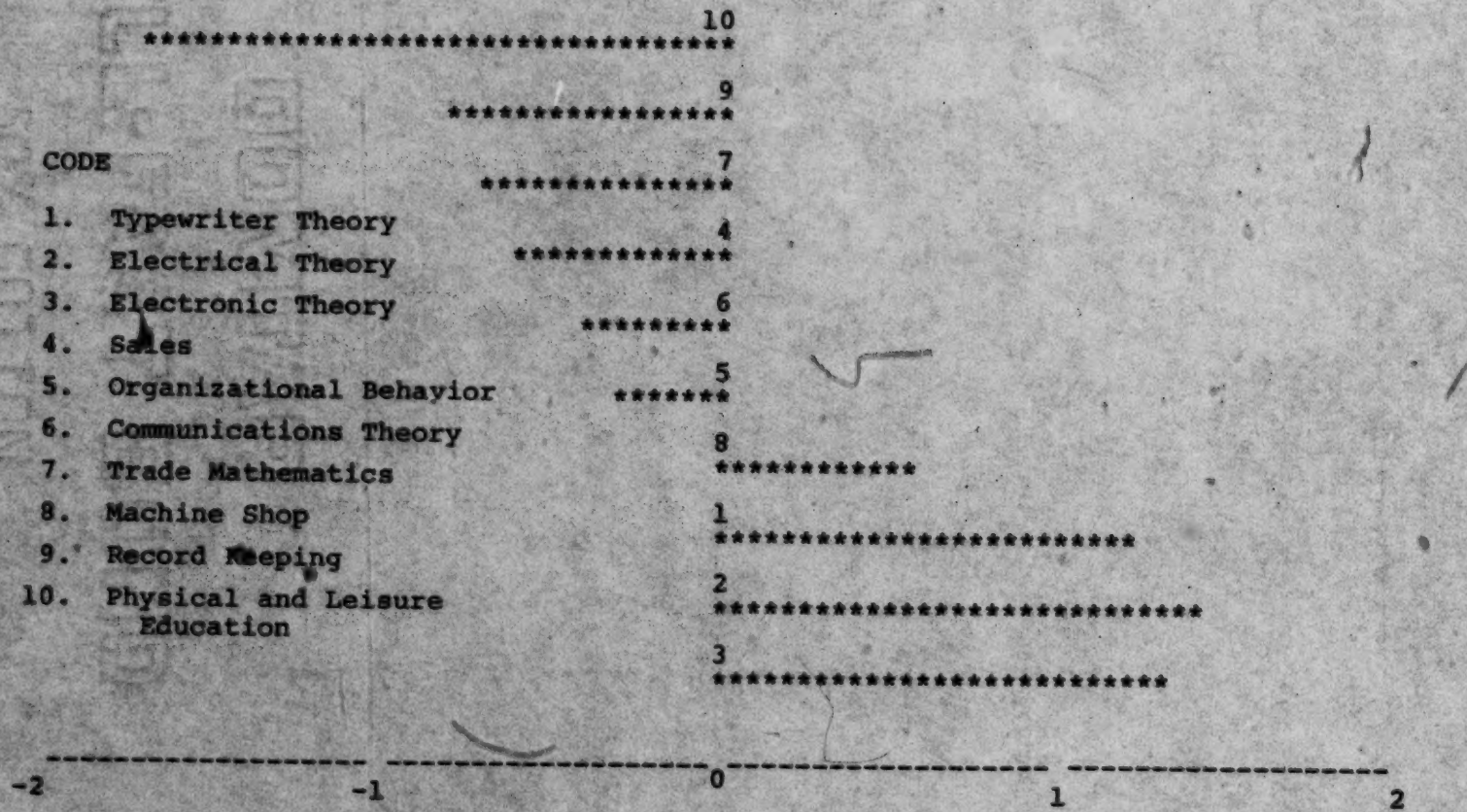
Stimulus No.	Scale Value	Areas
10	-1.679	Physical and Leisure Education
9	-0.797	Record Keeping
7	-0.721	Trade Mathematics
4	-0.614	Sales
6	-0.386	Communications Theory
5	-0.276	Organizational Behavior
8	0.564	Machine Shop
1	1.208	Typewriter Theory
3	1.324	Electronic Theory
2	1.376	Electrical Theory

Skills - Total Sample

7	-2.050	Typing Skill
10	-0.930	Calculations and Records
9	-0.832	Salesmanship
8	-0.552	Communications Skill
6	0.434	Electrical Component Replacement
5	0.438	Typewriter Component Replacement
4	0.510	Electronic Component Replacement
3	0.591	Electronic Repair
2	0.984	Electrical Repairs
1	1.406	Typewriter Adjustments

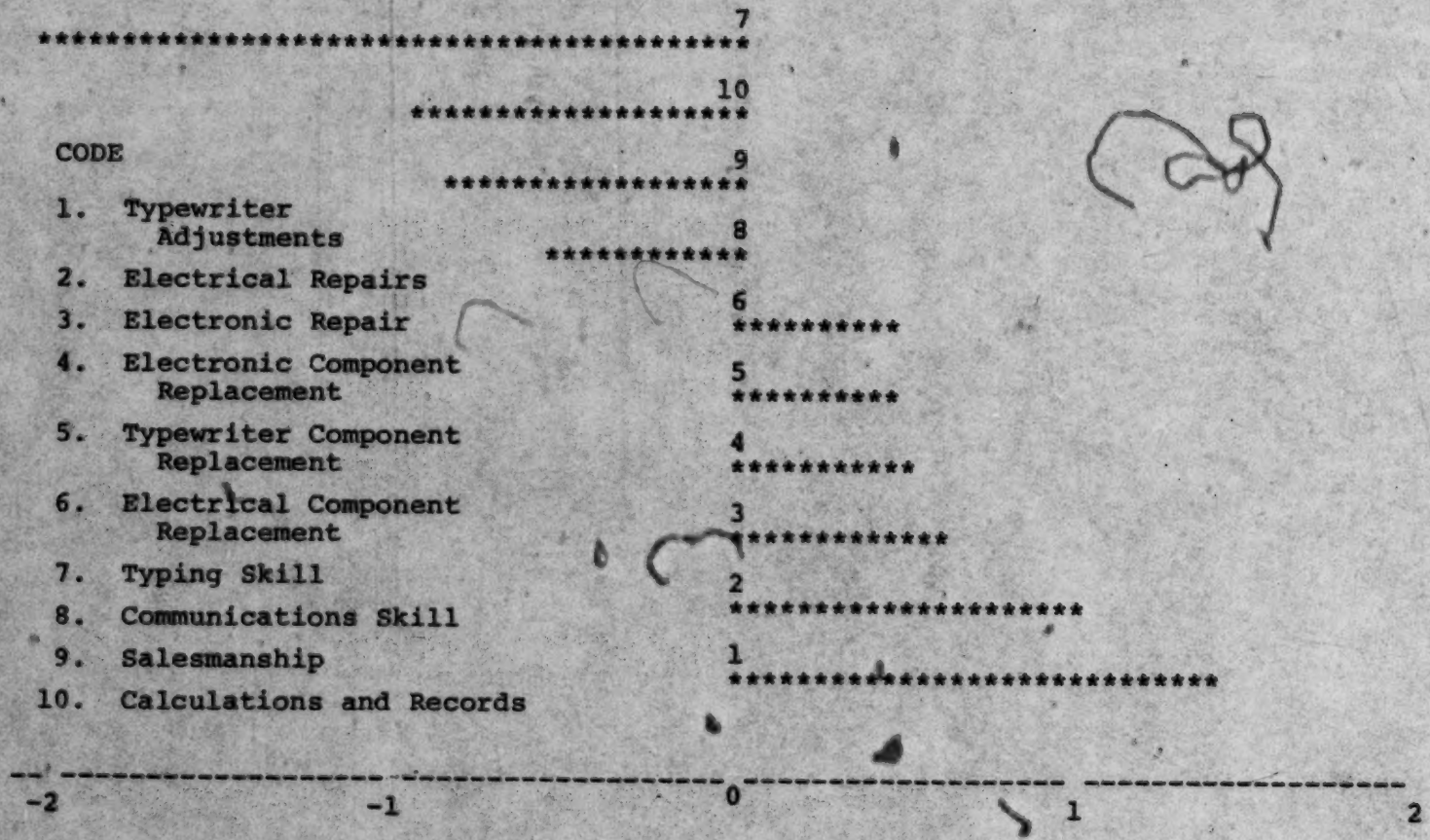
GRAPH OF SCALE VALUES

Figure III — Stimulus Number — Knowledge - Total Sample



GRAPH OF SCALE VALUES

Figure IV Stimulus Number Skill - Total Sample



CHAPTER VI

Observations Re Scale Value Results

This chapter provides comments on all categories of the scale values reported in Chapter V. The full interpretations of results appear in Chapter VII.

Electrical, Electronic and Typewriter Theory

In addition to comments listed above, it is worthwhile to note, in Table 20, that students rated electrical theroy highest and typewriter theory second, while service managers rated electronic theory highest and typewriter theory second highest. The dealership managers ratings correlated with those of the service managers, but placed electronic theory highest, electrical theory second highest, and typewriter theory third. This was a similar order to the service managers' preferences. However, the cumulative, total sample knowledge results, placed electrical theory highest, electronic theroy second and typewriter theory third highest in the same order as the dealership managers.

TABLE 20

Electrical, Electronic and Typewriter Theory
(n=63)

Group	Electrical	Electronic	Typewriter
Students	1.442	0.941	1.233
Service Managers	1.063	1.723	1.109
Dealership Managers	1.162	1.659	1.045
All (Cumulative)	1.376	1.324	1.208

Electrical Repair, Electronic Repair, Electronic Component Replacement, Typewriter Component Replacement and Electrical Component Replacement

The above areas of skill, that correspond to areas of knowledge listed in Table 21, were listed in order of scale values assigned cumulatively, as appeared in Table 18.

The cumulative result for electrical repairs was 0.984, second highest rating of the skill areas. The students results were 1.115, the service managers 0.751 and dealership managers 0.657.

Electronic repair over-all was at 0.591 with the dealership managers having rated the skill higher at 1.444 than the students who rated it at 0.471. The service managers' results were lower than dealership managers, having rated the skill at 0.202.

Electronic component replacement was rated lower by the students at 0.296, while dealership managers

gave it 0.839, their third highest rated skill. The service managers considered it the second most important skill, assigning it a scale value of 0.913, a very similar rating.

Electrical component replacement was denoted the sixth skill in importance, cumulatively at 0.434, but was listed fourth by service managers at 0.731, and fifth by dealership managers at 0.250. The students also rated it fifth at 0.339.

Typewriter component replacement was rated fifth, cumulatively, at 0.438, although the students rated it third at 0.742. The service managers rated it fifth at 0.291 and dealership managers, sixth, at -0.207.

TABLE 21

Electrical Repairs, Electronic Repair, Electronic Component Replacement, Typewriter Component Replacement And Electrical Component Replacement (n=63)

Electrical Repairs	Electronic Repair	Electronic Component Replace.	Typewriter Component Replace.	Electrical Component Replace.
STUDENTS				
1.115	0.471	0.296	0.742	0.339
SERVICE MANAGERS				
0.751	0.202	0.913	0.291	0.731
DEALERSHIP MANAGERS				
0.657	1.444	0.839	-0.207	0.250
ALL (CUMULATIVE)				
0.984	0.591	0.510	0.438	0.434

Typewriter Adjustments

This was rated the most important skill by two groups, see Table 22, and this was reflected in the cumulative, all skills results with the 1.406 rating being the highest cumulative result in either the skill or knowledge areas.

TABLE 22

Typewriter Adjustments
(n=63)

Group	Scale Value
Students	1.425
Service Managers	1.350
Dealership Managers	0.937
All (Cumulative)	1.406

Sales and Salesmanship

The students, as shown in Table 23, rated salesmanship at -0.767, the dealership managers rated it -0.750 and the cumulative rating was -0.832, while the service managers rated it very low at -1.053. Similar ratings were reflected for sales knowledge, as the service managers valued it at -1.229, while dealership managers' results showed -0.543 and the students gave it a higher rating at -0.334. The cumulative rating showed -0.614,

within the standard deviation, but fourth from the bottom of the knowledge areas. Salesmanship was third from the bottom of the skill ratings, a similarly low rating of importance.

TABLE 23

Sales and Salesmanship
(n=63)

Group	Sales	Salesmanship
Students	-0.334	-0.767
Service Managers	-1.229	-1.053
Dealership Managers	-0.543	-0.750
All (Cumulative)	-0.614	-0.832

Record Keeping, Trade Mathematics and Calculation and Records Skill

Record keeping, as shown in Table 24, was considered unimportant by students at -1.191. It was rated moderately important by service managers at -0.216 and by dealership managers at -0.296. The cumulative result at -0.797, placed record keeping as the second lowest rated skill. Trade mathematics was the third lowest rated knowledge area, cumulatively, at -0.721; the service managers rated it at -0.962 and dealership managers at -0.811, indicating very little importance. The students rated it slightly more

important, at -0.584. Calculations and records skill was rated very unimportant by students, at -1.109, but rated higher by dealership managers at -0.787 and service managers at -0.704. The cumulative results, at -0.930, indicated a very low importance rating, generally.

TABLE 24

Record Keeping, Trade Mathematics, Calculations and Records

(n=63)

Group	Record Keeping	Trade Mathematics	Calculations & Records
Students	-1.191	-0.584	-1.109
Service Managers	-0.216	-0.962	-0.704
Dealership Managers	-0.296	-0.811	-0.787
All (Cumulative)	-0.797	-0.721	-0.930

Physical and Leisure Education

As reflected in Table 25, this area was ranked the last or number ten area of knowledge, in terms of its importance as a part of the curriculum. Individually, it was rated by students at -1.576, service managers at -1.425, dealership managers at -1.686 and cumulatively by all at -1.679.

TABLE 25

Physical and Leisure Education
(n=63)

Group	Scale Values
Students	-1.576
Service Managers	-1.425
Dealership Managers	-1.686
All (Cumulative)	-1.679

Typing Skill

Cumulative results, in Table 26, showed this as a very unimportant skill area with the lowest rating of all skills, at -2.050. The individual results were; students, -1.879; service managers, -2.089; and dealership managers, -2.134.

TABLE 26

Typing Skill
(n=63)

Group	Scale Values
Students	-1.879
Service Managers	-2.089
Dealership Managers	-2.134
All (Cumulative)	-2.050

Communications Theory, Communications Skill

The dealership managers, as shown in Table 27, rated communications theory very low, at -0.916, while service managers reported -0.327 and students -0.183. The cumulative result was -0.386, the fifth lowest rating of areas of knowledge and below organizational behavior. The dealership managers, however, rated communications skill moderately important at -0.249, while service managers' ratings were close at -0.392, and similar to their rating for the communications theory area. The students' results, however, differed as they rated the skill much lower at -0.633. As a result, the cumulative skill result for communications was -0.552, or the fourth lowest rating for skill areas.

TABLE 27

Communications Theory, Communications Skill
(n=63)

Group	Theory	Skill
Students	-0.183	-0.633
Service Managers	-0.327	-0.392
Dealership Managers	-0.916	-0.249
All (Cumulative)	-0.386	-0.552

Organizational Behavior

This item, as shown in Table 28, was rated low, at -0.614, by students. The dealership managers' results showed their evaluation at 0.124 and the service managers attached greater importance, at 0.219. The cumulative result, still in the medium range, below the centre-point, was -0.276.

TABLE 28

Organizational Behavior
(n=63)

Group	Scale Values
Students	-0.614
Service Managers	0.219
Dealership Managers	0.124
All (Cumulative)	-0.276

Machine Shop

As shown in Table 29, this was the fourth highest rated area of knowledge cumulatively, at 0.564. All three groups rated it positively; 0.044 by service managers, 0.263 by dealership managers and much higher by students at 0.866.

TABLE 29

Machine Shop
(n=63)

Group	Scale Values
Students	0.866
Service Managers	0.044
Dealership Managers	0.263
All (Cumulative)	0.564

SUMMARY

The results indicated that the scale values obtained were readily compared. An interpretation of observations made regarding scale value results, appears in Chapter VII, with conclusions and further recommendations.

CHAPTER VII

Interpretations, Conclusions, Recommendations

This chapter interprets the results and observations presented in Chapter VI, lists conclusions and presents recommendations regarding the curriculum and further study.

Interpretations

In the observations in Chapter VI, four groups; theory courses, repair and component replacement courses, typewriter adjustments and machine shop, were treated separately and separate tables presented. The Tables 20, 21, 22 and 29, reflected the rating for these four groups for each group of respondents; the students, service managers and dealership managers. In addition, the cumulative scale values for all respondents were included. Table 30 reflects only the positive scale values, cumulative, Total Sample Knowledge and Total Sample Skill, in descending order, for four groups.

These four groups included the four top-rated knowledge areas; Electrical, Electronic and Typewriter Theory and Machine Shop. Also, the six top-rated skill areas; Typewriter Adjustments, Electrical Repairs, Electronic Repair and Electronic, Typewriter and Electrical Component Replacement.

TABLE 30

Positive Scale Values Only

Knowledge - Total Sample
(n=63)

(Descending Order)

Stimulus No.	Scale Value	Area
2	1.376	Electrical Theory
3	1.324	Electronic Theory
1	1.208	Typewriter Theory
8	0.564	Machine Shop

Skills - Total Sample
(n=63)

(Descending Order)

Stimulus No.	Scale Value	Area
1	1.406	Typewriter Adjustments
2	0.984	Electrical Repairs
3	0.591	Electronic Repairs
4	0.510	Electronic Component Replacement
5	0.438	Typewriter Component Replacement
6	0.434	Electrical Component Replacement

The knowledge and skill areas involved, constitute every area in which the scale values exceeded the centre-point, arbitrarily assigned as zero. Therefore, all areas preferred by all respondents, as most important on the job for all office machine technicians, are included in this group. These groups should form the core curriculum, together with these additional subjects; electronic theory, electronic repair and electronic component replacement.

Further interpretations of the comparisons previously made in Chapter VI are possible with the combined Table 31, providing reference for the scale values established for knowledge and skills for each group of respondents.

Typewriter Adjustments

As the highest rated skill on the cumulative results, at 1.406, it received highest ratings from students, service managers and dealership managers and its top rating appeared justified. The simple average of the three scale value ratings was 1.237.

Electrical Theory, Electronic Theory, Typewriter Theory

Electrical theory was the highest rated of the theory areas, at 1.376, but this was because of the high student rating of 1.442. The simple average for the ratings of students, service and dealership managers was 1.222.

TABLE 31

Combined Table - Knowledge and Skills

(n=63)

	Students		Service Managers		Dealership Managers	
	KNOWLEDGE					
10.	Physical and Leisure Education	-1.576	10. Physical and Leisure Education	-1.425	10. Physical and Leisure Education	-1.636
9.	Record Keeping	-1.191	4. Sales	-1.229	6. Communication Theory	-0.916
7.	Trade Mathematics	-0.584	7. Trade Mathematics	-0.962	7. Trade Mathematics	-0.811
5.	Organizational Behavior	-0.614	6. Communication Theory	-0.327	4. Sales	-0.543
4.	Sales	-0.334	9. Record Keeping	-0.216	9. Record Keeping	-0.296
6.	Communication Theory	-0.183	8. Machine Shop	0.044	5. Organizational Behavior	0.124
8.	Machine Shop	0.866	5. Organizational Behavior	0.219	8. Machine Shop	0.263
3.	Electronic Theory	0.941	2. Electrical Theory	1.063	1. Typewriter Theory	1.045
1.	Typewriter Theory	1.233	1. Typewriter Theory	1.109	2. Electrical Theory	1.162
2.	Electrical Theory	1.442	3. Electronic Theory	1.723	3. Electronic Theory	1.659
	SKILLS					
7.	Typing Skill	-1.879	7. Typing Skill	-2.089	7. Typing Skill	-2.134
10.	Calculations and Records	-1.109	9. Salesmanship	-1.053	10. Calculations and Records	-0.787
9.	Salesmanship	-0.767	10. Calculations and Records	-0.704	9. Salesmanship	-0.750
8.	Communications Skill	-0.633	8. Communications Skill	-0.392	8. Communications Skill	-0.249
4.	Electronic Component Replacement	0.296	3. Electronic Repair	0.202	5. Typewriter Component Replacement	-0.207
6.	Electrical Component Replacement	0.339	5. Typewriter Component Replacement	0.291	6. Electrical Component Replacement	0.250
3.	Electronic Repair	0.471	6. Electrical Component Replacement	0.731	2. Electrical Repairs	0.657
5.	Typewriter Component Replacement	0.742	2. Electrical Repairs	0.751	4. Electronic Component Replacement	0.839
2.	Electrical Repairs	1.115	4. Electronic Component Replacement	0.913	1. Typewriter Adjustments	0.937
1.	Typewriter Adjustments	1.425	1. Typewriter Adjustments	1.350	3. Electronic Repair	1.444

The dealership managers rated it second at 1.162 and the service managers, who should be more intimately involved with the service work, only rated it third in importance, at 1.063. This is an example in which results obtained only from a survey of students could be misleading in curriculum validation. In this case, the student responses outnumbered the dealer responses and the service manager responses, thus affecting the cumulative scale values.

Electronic theory, with a cumulative scale value of 1.324, was the second highest rating for theory courses, although it was rated third at 0.941 by the students. The dealership rating of highest importance at 1.659, possibly reflected a truer picture, especially when service managers also rated it highest at 1.723. In addition, the list of 75 dealerships, in Appendix C, indicated that firms listed as typewriter dealers outnumbered those listed as electronic equipment dealers, i.e., dealers handling electronic calculators, recorders and transcribers. This fact made the importance of the top rating by service managers and dealership managers even more impressive. Furthermore, the average scale value rating for electronic theory, was 1.441, higher even than typewriter adjustment skill.

Typewriter theory, at 1.208, was the third rated Total Sample - Knowledge area. It was rated by students as second at 1.233, and second by service managers at 1.109, while dealership managers rated it third at 1.045.

Considering the effect of the larger student response, which obviously increased the scale values for electrical and typewriter theory, the priority established by the dealership managers of: 1-electronic theory, 2-electrical theory and 3-typewriter theory, appears most valid. These results also appeared to reinforce the noticeable progression in the office machine field from standard typewriters and hand-operated calculators to electric and, now, to electronic calculators and business machines. The OMT Advisory Committee had been strongly recommending electronic training for students and the survey result is interpreted as validating their request to include this area of knowledge in the curriculum. The average of scale values for the three groups of respondents, was 1.129 for typewriter theory.

A listing of the averages of scale values for each area of knowledge and skill appears in Table 32 and these results confirm the following priorities:

1.	Electronics Theory	1.441
2.	Typewriter Adjustments	1.237
3.	Electrical Theory	1.222
4.	Typewriter Theory	1.129

TABLE 32

Averages

Knowledge and Skills

(n=63)

Code	Description	Averages
K. 3	Electronic Theory	1.441
S. 1	Typewriter Adjustments	1.237
K. 2	Electrical Theory	1.222
K. 1	Typewriter Theory	1.129
S. 2	Electrical Repairs	0.841
S. 3	Electronic Repair	0.706
S. 4	Electronic Component Replacement	0.683
S. 6	Electrical Component Replacement	0.440
K. 8	Machine Shop	0.391
S. 5	Typewriter Component Replacement	0.275
K. 5	Organizational Behavior	-0.090
S. 8	Communications Skill	-0.424
K. 6	Communications Theory	-0.475
K. 9	Record Keeping	-0.568
K. 4	Sales	-0.702
K. 7	Trade Mathematics	-0.786
S. 9	Salesmanship	-0.857
S. 10	Calculations and Records	-0.867
K. 10	Physical and Leisure Education	-1.562
S. 7	Typing Skill	-2.034

Codes:

K. = Knowledge

S. = Skill

Electrical Repairs, Electronic Repair, Electronic, Typewriter and Electrical Component Replacement

In the skill areas, electrical repairs was rated second at 0.984, but as in the case of electrical theory, this was affected by the larger student component. They rated electrical repairs second, at 1.115; while the dealership managers rated it fourth, at 0.657; and the service managers said third, at a higher rating of 0.751. It, therefore, appeared that the lower rating of this skill, as the third most important skill was more correct than the cumulative rating as second. In fact, the average scale value was 0.841, quite close to the service managers' rating.

The third rated skill at 0.591, was electronic repair and the fourth skill was electronic component replacement, at 0.510. The individual electronic repair rating was a rating of fourth, by students at 0.471, while dealership managers rated it first at 1.444 and service managers sixth at 0.202. Here, the dealer rating had a distorting effect on its rank. Average scale value was 0.706.

The distortion by the student responses also occurred in electronic component replacement, where the 0.510 score resulted from a student rating of sixth in importance, while service managers and dealership managers had rated it second and third, at 0.913 and 0.839, respectively. The average scale value was 0.683.

Typewriter component replacement, at 0.438 and electrical component replacement at 0.434, were also affected by the heavier student responses. There was little difference in the ratings, but typewriter component replacement was rated fifth in importance and electrical component replacement, sixth. This distortion came from the student rating of typewriter component replacement as third, at 0.742, while the dealership managers and service managers rated it sixth and fifth, at -0.207 and 0.291. Conversely, the dealership managers and service managers rated electrical component replacement higher, at 0.250 and 0.731, while students rated it fifth, at only 0.339. The average scale values were 0.275 and 0.440.

The interpreted results, therefore, appeared to rank the skill areas as follows:

1. Typewriter Adjustments
2. Electronic Component Replacement
3. Electrical Repairs
4. Electrical Component Replacement
5. Typewriter Component Replacement
6. Electronic Repair

However, this was not fully considered, for using the averages as shown in Table 32, the ratings changed to:

1. Typewriter Adjustments
2. Electrical Repairs
3. Electronic Repair

4. Electronic Component Replacement

5. Electrical Component Replacement

6. Typewriter Component Replacement

This averaging of scale values dampens, in part, the distortion of student responses and provides a better comparison of group results.

The students' distinct lack of emphasis on electronics as compared with service manager and dealership manager emphasis, may be possibly a reflection of their primary concentration on typewriters early in their employment and the fact that returns from the most recent graduates were higher than from other years.

The approximate values and rankings of service managers and dealership managers in a similar configuration, shows this similarity of results, Figure V. The configuration shows the strongest difference in evaluation in the area of sales knowledge, which was very poorly rated by the service managers. In Figure VI, skills, a similarity of configuration appeared in the graph with the only great difference caused by the dealership managers' very high evaluation of electronic repair. This contrasted greatly with the much lower rating by the service managers.

Sales and Salesmanship

Group 4, in Chapter VI, dealt with sales and salesmanship and the low priority assigned each by all groups. The "written" comments of students, in Appendix C,

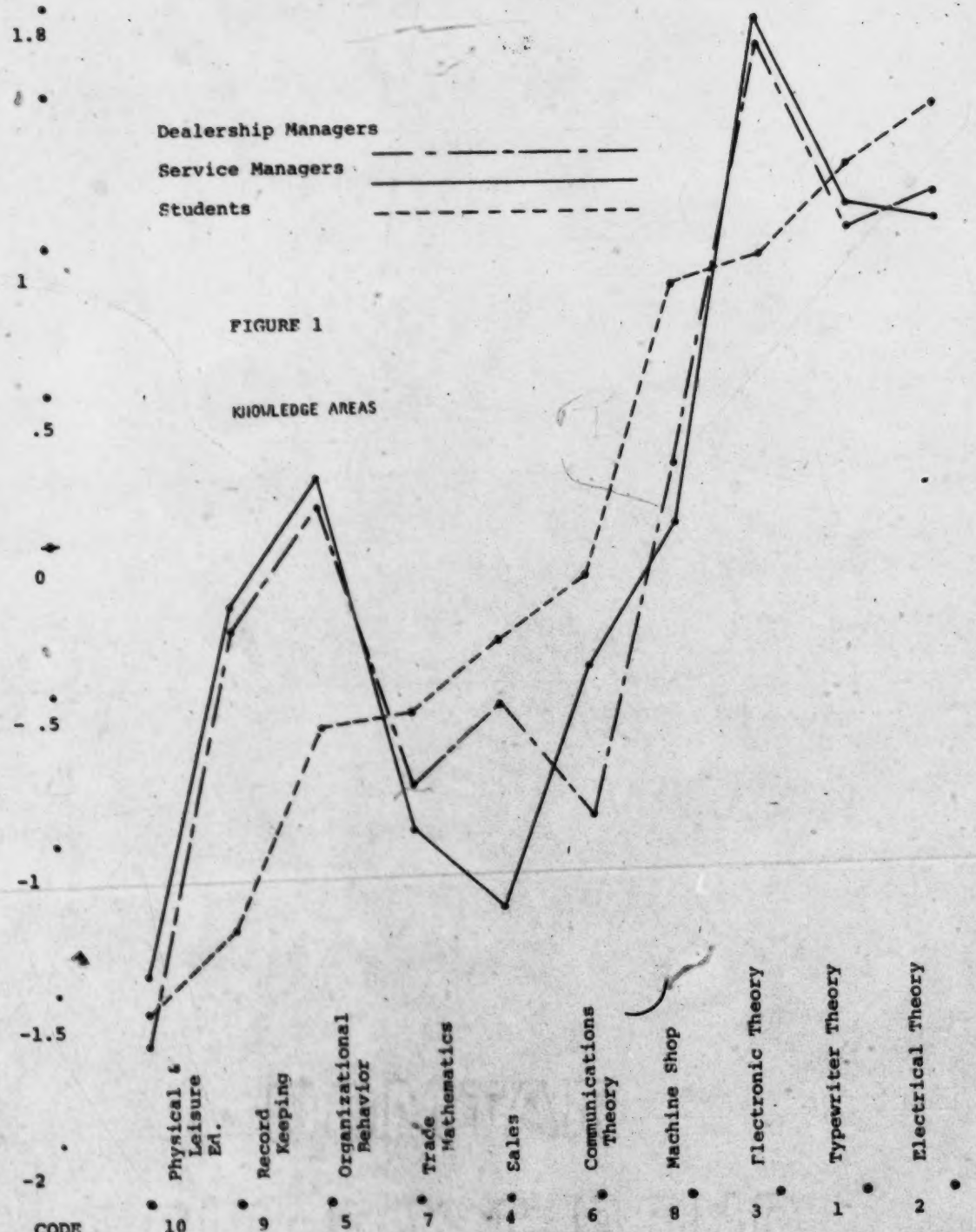


FIGURE 1

KNOWLEDGE AREAS

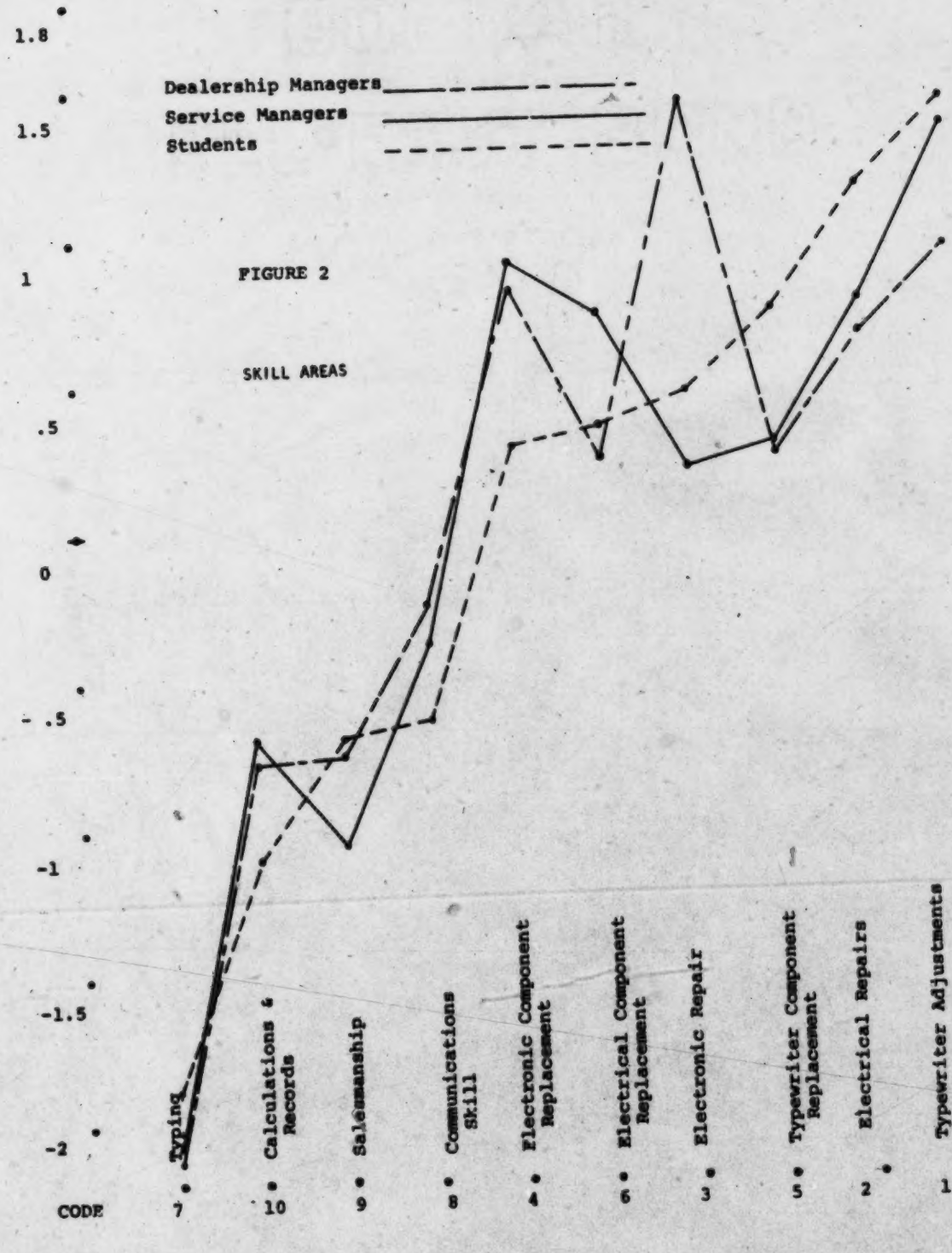


FIGURE 2

SKILL AREAS

reflected a mounting concern for human relationships and public relations. It was suggested this may have affected their higher rating of these areas. The service manager obviously wanted the service emphasis, not sales orientation, and it would appear the dealership managers, who were expected to support sales, were making a clear distinction between service staff and sales personnel. The Advisory Committee's suggestion of sales orientation or training for OMT students, occurred at the time a sales manager was chairman of the Committee. This suggested area of curriculum received quite a low preference rating and probably should not be introduced into the curriculum.

Record Keeping, Trade Mathematics, Calculations and Records

Group 5, of Chapter VI, reviewed record keeping, trade mathematics and calculations and records skills. It indicated real questions about the value of record keeping and records skill and it would appear to have validated the previous action of cancelling the former OMT bookkeeping course. All record training should be double checked with industry, to determine its real unity. However, the student support of a trade mathematics appeared to reflect satisfaction of a felt need and suggested that its retention should be attempted with caution. The suggestion of caution, is due to service managers and dealership managers' low ratings. Its content and length should also be questioned.

Physical and Leisure Education

Group 6, Chapter VI, physical and leisure education results indicated rejection of this subject, as invalid for the OMT curriculum. The course was being tried on a trial basis for the first time during the year this survey was made and its description could have been misinterpreted. Extreme caution and rigid review was indicated.

Group 7, Chapter VI, indicated the teaching of typing to OMT students was rejected. Cancellation of the course appeared to be in order, due to the overwhelming negative results of the survey, at -2.050.

Communications Theory, Communications Skill

Group 8, Chapter VI, communications theory and skill indicated that dealership managers rejected the theory, but not the skill, while the students rated the theory important and the skill unimportant. The conflicting results and the service managers' reasonable rating suggested retention with updating or review of objectives. Scale value averages of -0.424 and -0.475, appeared to support retention and review.

Organizational Behavior

Group 9, Chapter VI, organizational behavior, indicated the dealership managers' acceptance may have come from a greater exposure and understanding, while service managers appeared to have recognized its value. The students' low rating, again suggests a check of emphasis, but a reasonable validation was indicated. The average of scale values was -0.090.

Machine Shop

Group 10, Chapter VI, machine shop, indicated retention and validation by way of strong student support and the dealership managers and service managers' acceptance of this knowledge area. The scale value average was 0.391.

Conclusions

1. Service managers' and dealership managers' perceptions of the relevance of areas of knowledge and skill were similar with two noteable exceptions. The service managers' perceptions of the importance of sales and electronic repair skill, were significantly lower than the perceptions of the dealership managers.

2. Generally, the students' perceptions of the relevance of curriculum areas differed markedly from those

of the service managers and dealership managers.

3. The cumulative results of the perceptions of importance of curriculum areas indicated that curriculum relevancy was readily identifiable to the technicians' on-the-job requirements.

4. The paired-comparison questionnaire on identified curriculum areas, administered to an adequate population of multiple groups, reasonably knowledgeable about on-the-job requirements of graduates, appeared to have value for establishing the relevancy of knowledge and skills.

5. The paired-comparison questionnaire, however, limits the number of curriculum areas that can be reasonably surveyed at the same time.

6. Industry members, particularly service managers, welcomed research in the office machine occupational field and an unforseen benefit of the research was an increase in their interest and involvement with NAIT.

Recommendations

1. A further study should be undertaken to identify the specific electronic knowledge and skills relevant to the OMT curriculum.

2. Student follow-up studies should be combined with general industrial surveys, including feedback from

on-the-job supervisors. Multiple group responses assist interpretation of relevancy.

3. Student follow-up should be restricted to students who have received the training in the last five years. Beyond that period, experimental-mortality and curriculum changes reduce the value of the research expenditure.

4. The forced-choice inherent in the paired-comparison research questionnaire, is recommended for any technical or vocational employment program evaluation.

5. A stricter procedure in obtaining and recording permanent addresses of N.A.I.T. students and a pre-graduation commitment to student participation in follow-up studies, should be obtained.

6. Personal contact should supplement the telephone follow-up with industry, to obtain greater questionnaire completion and return.

7. Although all levels of management, labor and government should be represented on N.A.I.T. Advisory Committees, it is recommended that first line supervisors or service managers should be in the majority.

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APPENDIX A

PILOT STUDY

ORIGINAL COVERING LETTER, STUDENTS - ORIGINAL QUESTIONNAIRE

COVERING LETTER & SECTION INTRODUCTION, SERVICE MANAGERS

COVERING LETTER & SECTION INTRODUCTION, DEALERSHIP MANAGERS

COVERING LETTER & SECTION INTRODUCTION, INSTRUCTORS

A CURRICULUM EVALUATION - OFFICE MACHINE TECHNICIANS

You have been selected as one of two graduate students to participate in a pilot study for the above program as a member of a board of experts consisting of two service managers, two NAIT instructors, two dealership managers and two students.

May I have the benefit of your analysis of what areas of knowledge are required on the job and what skills. I have included areas suggested by the Advisory Committee members in their meetings, not just what you may have had in your course of studies.

Thank you for your assistance in completing this preliminary, general questionnaire which will permit preparation of the full follow-up survey.

Phones

HOME 482 - 2486

OFFICE 477 - 4205

Researcher

R.A. North
8903 - 140 Street
EDMONTON, Alberta

A. Knowledge Areas

(Read these definitions to become familiar with the terminology used in this questionnaire.)

1. Typewriter Theory - The basic mechanical principles of a standard typewriter, excluding electrical theory. Including design and performance requirements.

2. Electrical Theory - Introduction to electricity, basic symbols, units, components, measurements, laws, circuits, and application to office machines. Includes fuses and protective devices, switches, contacts, relays, A/C and D/C motor theory, characteristics and ratings of motors, speed control, causes, effects and remedies.

3. Electronic Theory - Basic electronic theory, units, symbols, and components, diodes, transistors, integrated circuits, printed circuits and application to office machines. Includes radio theory, television theory, audio theory and related areas of electronic test equipment; electronic voltmeter, oscilloscopes, signal generators, tube testers and transistor testers.

4. Sales - An introduction to the concept of professional selling. Includes consumer motivation, product knowledge, the selling process and the importance of salesmanship to the individual, society, and the office machine business specifically.

5. Organizational Behavior (Human Relations) - Applied Psychology, sociology related to the business organization and consideration of practical problems faced by a service repairman or technician in his daily work. Provides a scientific analysis of individual's behavior to aid the student in understanding himself and others.

6. Communications Theory - An introduction to the theory of communications and its application to business and social situations. Designed to up grade the students effectiveness in reading skills and in oral and written communication.

7. Trade Mathematics - An introduction to basic mathematics with emphasis on use of formulas, geometry, trigonometry, use of the slide rule, introductory calculus and metric calculations.

8. Machine Shop - Use and care of handtools and instruments employed in benchwork, layout and measurement. Fundamentals of metal cutting tools including methods of resharpening and reconditioning. Effectiveness of good shop practice, principles of soldering and heat-treatment of metals. Drilling machines and general outline of methods utilized in the manufacture of metal components.

9. Record Keeping - An introduction to business records including job sheets, time sheets, repair-pricing, order numbers, invoices and the basic accounting cycle.

10. Physical and Leisure Education - A wide selection of physical and recreational activities with increasing emphasis on general education for life, personal financial management and use of leisure time.

QUESTIONNAIRE

Section A.

As a graduate student, you know from on the job experience, what areas of knowledge you require.

Which of the following areas of knowledge do you consider most important for you?

If I have missed areas, please record them in the space provided on the last sheet.

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area of knowledge you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of knowledge areas.

B. Please put in one tick (✓) for each pair of knowledge areas.

C. Do not check more than one knowledge area in each pair.

1. Typewriter Theory
   Recordkeeping

2. Electrical Theory
   Physical and Leisure Education

3. Electronic Theory
   Electrical Theory

4. Typewriter Theory
   Sales

5. Organizational Behavior
   Trade Mathematics

6. Recordkeeping
   Machine Shop

7. Electrical Theory
   Typewriter Theory

8. Communications Theory
   Electrical Theory

9. Physical and Leisure Education
   Sales

10. Machine Shop
    Communications Theory

11. Sales
    Electrical Theory

12. Communications Theory
    Typewriter Theory

13. Trade Math
    Electronic Theory

14. Machine Shop
    Electrical Theory

15. Organizational Behavior
    Typewriter Theory

16. Physical and Leisure Education
    Organizational Behavior

17. Electronic Theory
    Typewriter Theory

18. Organizational Behavior
    Sales

19. Typewriter Theory
    Trade Math

20. Physical and Leisure Education
    Typewriter Theory

21. Trade Math
    Machine Shop

22. Electrical Theory
    Organizational Behavior

23. Recordkeeping
    Physical and Leisure Education

24. Organizational Behavior
    Electronic Theory

25. Communications Theory
    Organizational Behavior

26. Trade Math
    Communications Theory

27. Sales
Recordkeeping

28. Machine Shop
Physical and Leisure Education

29. Electrical Theory
Trade Math

30. Recordkeeping
Electrical Theory

31. Typewriter Theory
Machine Shop

32. Electronic Theory
Physical and Leisure Education

33. Sales
Electronic Theory

34. Communications Theory
Sales

35. Organizational Behavior
Machine Shop

36. Recordkeeping
Communications Theory

37. Sales
Trade Math

38. Electronic Theory
Communications Theory

39. Trade Math
Recordkeeping

40. Recordkeeping
Organizational Behavior

41. Electronic Theory
Machine Shop

42. Communications Theory
Physical and Leisure Education

43. Machine Shop
Sales

44. Electronic Theory
Recordkeeping

45. Trade Math
Physical and Leisure Education

B. Skill Areas

1. Typewriter Adjustments.

2. Electrical Repairs.

3. Electronic Repair.

4. Electronic Component Replacement.

5. Typewriter Component Replacement.

6. Electrical Component Replacement.

7. Typing Skill.

8. Communications Skill.

9. Salesmanship.

10. Calculations and Records.

Section B.

As a graduate student, you know what skills you require on the job. Which of the following areas of skill do you consider most important to you?

If I have missed areas, please record them in the space provided on the last sheet.

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of skill areas.

B. Please print in one tick (✓) for each pair of skill areas.

C. Do not check more than one skill area in each pair.

1. Calculations and Records
   Typewriter Adjustments

2. Communications Skill
   Electrical Repairs

3. Electrical Component Replacement
   Electronic Repair

4. Electronic Component Replacement
   Typewriter Component Replacement

5. Electrical Repairs
   Electrical Component Replacement

6. Typewriter Adjustments
   Communications Skill

7. Electronic Repair
   Salesmanship

8. Typewriter Component Replacement
   Calculations and Records

9. Typing Skill
   Communications Skill

10. Salesmanship
    Calculations and Records

11. Electronic Repair
Typewriter Component Replacement

12. Typewriter Component Replacement
Electrical Component Replacement

13. Typing Skill
Typewriter Component Replacement

14. Salesmanship
Typing Skill

15. Communications Skill
Salesmanship

16. Typing Skill
Electrical Component Replacement

17. Electrical Component Replacement
Electronic Component Replacement

18. Typewriter Component Replacement
Electrical Repairs

19. Electronic Component Replacement
Typewriter Adjustments

20. Electronic Repair
Electrical Repairs

21. Typewriter Adjustments
Electrical Repairs

22. Electronic Repair
Typewriter Adjustments

23. Electrical Repairs
Electronic Component Replacement

24. Electronic Component Replacement
Electronic Repair

25. Typewriter Adjustments
Typewriter Component Replacement

26. Electrical Component Replacement
Typewriter Adjustments

27. Calculations and Records
Electrical Repairs

28. Electronic Component Replacement
Calculations and Records

29. Typing Skill
Typewriter Adjustments

30. Communications Skill
Typewriter Component Replacement

31. Salesmanship
Electrical Repairs

32. Typewriter Adjustments
Salesmanship

33. Electrical Repairs
Typing Skill

34. Electrical Component Replacement
Calculations and Records

35. Electronic Repair
Typing Skill

36. Electronic Component Replacement
Communications Skill

37. Typing Skill
Calculations and Records

38. Salesmanship
Electronic Component Replacement

39. Electronic Component Replacement
Typing Skill

40. Communications Skill
Electronic Repair

41. Calculations and Records
Electronic Repair

42. Electrical Component Replacement
Communications Skill

43. Typewriter Component Replacement
Salesmanship

44. Salesmanship
Electrical Component Replacement

45. Calculations and Records
Communications Skill

If I have missed any areas of knowledge, skills or attitudes that you feel are important, pleased list them below.

A. Knowledge.

1. _____

_____

_____

2. _____

_____

_____

B. Skills.

1. _____

_____

_____

C. Other Comments.

1. _____

_____

_____

2. _____

_____

_____

COVERING LETTER, SERVICE MANAGERS

A CURRICULUM EVALUATION - OFFICE MACHINE TECHNICIANS

You have been chosen to participate in this pilot study as one of a panel of experts and one of two fully experienced service managers selected.

May I have the benefit of your experience in completing this preliminary, general questionnaire.

Your identification of key concepts or areas of knowledge and the requisite skills to perform on the job will assist in completing the questionnaire for a follow-up study of our graduates.

Thank you for your time and assistance.

Phones

HOME 482 - 2486

WORK 477 - 4205

Researcher

R.A. North
8903 - 140 Street
EDMONTON, Alberta

QUESTIONNAIRE

Section A Introduction, Service Managers

In supervising repairmen and evaluating their work, you consciously or unconsciously have analysed what is required by the office machine technician on the job.

Which of the following areas of knowledge do you consider most important for your employees?

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area of knowledge you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of knowledge areas.

B. Please put in one tick (✓) for each pair of knowledge areas.

C. Do not check more than one knowledge area in each pair.

1. Typewriter Theory
   Recordkeeping

2. Electrical Theory
   Physical and Leisure Education

3. Electronic Theory
   Electrical Theory

4. Typewriter Theory
   Sales

5. Organizational Behavior
   Trade Mathematics

6. Recordkeeping
   Machine Shop

7. Electrical Theory
   Typewriter Theory

8. Communications Theory
   Electrical Theory

Section B Introduction, Service Managers

You require that your service employees possess certain skills. I have included some areas that have been mentioned by the NAIT Advisory Committee from time to time. If there are any areas I have missed, please write them in on the last sheet in the space provided.

Which of the following areas of skill do you consider most important for your service employees?

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of skill areas.

B. Please print in one tick (✓) for each pair of skill areas.

C. Do not check more than one skill area in each pair.

1. Calculations and Records
   Typewriter Adjustments

2. Communications Skill
   Electrical Repairs

3. Electrical Component Replacement
   Electronic Repair

4. Electronic Component Replacement
   Typewriter Component Replacement

5. Electrical Repairs
   Electrical Component Replacement

6. Typewriter Adjustments
   Communications Skill

7. Electronic Repair
   Salesmanship

8. Typewriter Component Replacement
   Calculations and Records

9. Typing Skill
   Communications Skill

COVERING LETTER, DEALERSHIP MANAGERS

A FOLLOW UP STUDY - OFFICE MACHINE TECHNICIANS

Your interest in all aspects of the Office Machine Industry as displayed by your significant contribution to the NAIT Advisory Committee for the above program, has led to your selection as one of two dealership managers requested to participate in a pilot study.

Your assistance is requested in completing this preliminary, general questionnaire as a member of a panel of experts consisting of 2 dealership managers, 2 service managers, 2 instructors, and 2 student graduates from the program.

Your identification of key knowledge areas and requisite skills as you see them required on the job, will permit preparation of the questionnaire for this curriculum evaluation study.

Thank you for your time and assistance.

Phones

HOME 482 - 2486

OFFICE 477 - 4205

Researcher

R.A. North
8903 - 140 Street
EDMONTON, Alberta

QUESTIONNAIRE

Section A. Introduction, Dealership Managers

You require that your service employees possess certain concepts or areas of knowledge and skill to perform on the job.

Which of the following areas of knowledge do you consider most important for your service employees?

If I have omitted areas, please note them in the space provided on the last page.

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area of knowledge you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of knowledge areas.

B. Please put in one tick (✓) for each pair of knowledge areas.

C. Do not check more than one knowledge area in each pair.

1. Typewriter Theory ——— | | Recordkeeping

2. Electrical Theory ——— | | Physical and Leisure Education

3. Electronic Theory ——— | | Electrical Theory

4. Typewriter Theory ——— | | Sales

5. Organizational Behavior ——— | | Trade Mathematics

6. Recordkeeping ——— | | Machine Shop

7. Electrical Theory ——— | | Typewriter Theory

8. Communications Theory ——— | | Electrical Theory

Section B Introduction, Dealership Managers

You require that your service employees possess certain skills. I have included some areas that have been mentioned by the NAIT Advisory Committee from time to time. If there are any areas I have missed, please write them in on the last sheet in the space provided.

Which of the following areas of skill do you consider most important for your service employees?

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of skill areas.

B. Please print in one tick (✓) for each pair of skill areas.

C. Do not check more than one skill area in each pair.

1. Calculations and Records
   Typewriter Adjustments

2. Communications Skill
   Electrical Repairs

3. Electrical Component Replacement
   Electronic Repair

4. Electronic Component Replacement
   Typewriter Component Replacement

5. Electrical Repairs
   Electrical Component Replacement

6. Typewriter Adjustments
   Communications Skill

7. Electronic Repair
   Salesmanship

8. Typewriter Component Replacement
   Calculations and Records

9. Typing Skill
   Communications Skill

COVERING LETTER - INSTRUCTORS

A FOLLOW UP STUDY - OFFICE MACHINE TECHNICIANS

You have been exposed to the theory of Trade and Job analysis and in setting up and revising your course of studies for each subject have "zeroed in" on objectives for your program. Please give me the benefit of your experience and analysis in completing this general questionaire. Your identification of key concepts and skills will assist in setting up the overall follow up study of your graduates.

Researcher

R.A. North
8903 - 140 Street
EDMONTON, Alberta

Phones

HOME 482 - 2486

WORK 477 - 4205

QUESTIONNAIRE

Section A Introduction, Instructors

In teaching students, you wish them to learn certain key concepts in several areas of knowledge and to acquire skills in specific operations. Which of the following areas of knowledge do you consider most important for your students?

DIRECTIONS: For each pair of statements below, mark with a tick ( ) the area of knowledge you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of knowledge areas.

B. Please put in one tick ( ) for each pair of knowledge areas.

C. Do not check more than one knowledge area in each pair.

1. Typewriter Theory ——— | | Recordkeeping

2. Electrical Theory ——— | | Physical and Leisure Education

3. Electronic Theory ——— | | Electrical Theory

4. Typewriter Theory ——— | | Sales

5. Organizational Behavior ——— | | Trade Mathematics

6. Recordkeeping ——— | | Machine Shop

7. Electrical Theory ——— | | Typewriter Theory

8. Communications Theory ——— | | Electrical Theory

Section B Introduction, Instructors

In teaching students, you wish them to acquire certain key skills and concepts from general areas of knowledge. Which of the following areas of skill do you consider most important for your students?

DIRECTIONS: For each pair of statements below, mark with a tick ( ) the area you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of skill areas.

B. Please print in one tick ( ) for each pair of skill areas.

C. Do not check more than one skill area in each pair.

1. Calculations and Records
   Typewriter Adjustments

2. Communications Skill
   Electrical Repairs

3. Electrical Component Replacement
   Electronic Repair

4. Electronic Component Replacement
   Typewriter Component Replacement

5. Electrical Repairs
   Electrical Component Replacement

6. Typewriter Adjustments
   Communications Skill

7. Electronic Repair
   Salesmanship

8. Typewriter Component Replacement
   Calculations and Records

9. Typing Skill
   Communications Skill

10. Salesmanship
    Calculations and Records

APPENDIX B

PILOT STUDY - PANEL OF EXPERTS

PILOT STUDY - GROUP 1

PILOT STUDY - GROUP 2

PANEL OF EXPERTS

Instructors

Mr. George Rose, Senior Instructor, O.M.T. Program

Mr. Howard Gustafson, Instructor, O.M.T. Program NAIT

Service Managers

Mr. Kenneth Jolliffe, Office Products Division, I.B.M.

Mr. Dennis Evans, Service Manager, H.J. Kellam Ltd.

Students

Mr. Douglas Straughan, Office Manager, H.J.Kellam Ltd.

Mr. Leonard Strauss, Serviceman, Olivetti Canada Ltd.

Dealership Managers

Mr. Vincent Mahony, Universal Typewriter Ltd.

Mr. Robert Jenkins, Fred Jenkins Ltd.

PILOT STUDY

Group One

Instructor

Mr. George Rose

Service Manager

Mr. Kenneth Jolliffe

Student

Mr. Douglas Straughan

Dealership Manager

Mr. Vincent Mahony

PILOT STUDY

Group Two

Instructor

Mr. Howard Gustafson

Service Manager

Mr. Dennis Evans

Student

Mr. Leonard Strauss

Dealership Manager

Mr. Robert Jenkins

APPENDIX C

FINAL STUDY

COVERING LETTER, GRADUATE, FORMER STUDENT

FOLLOW-UP LETTER

INITIAL LETTER - DEALERSHIP AND SERVICE MANAGERS

COVERING LETTER, SECTION INTRODUCTIONS, DEALERSHIP AND SERVICE MANAGERS

LIST OF DEALERS

NORTHERN ALBERTA
INSTITUTE OF TECHNOLOGY
Department of
Advanced Education

403/477-4111
11762 - 106 Street
Edmonton, Alberta, Canada T5G 2R1

August 9th, 1974

COVERING LETTER, GRADUATE

Dear Graduate :

Re: NAIT Curriculum Evaluation
Office Machine Technicians

Please complete the attached survey to give me your feedback about the above program. You need only tick (✓) items to show me what areas of knowledge and skill you feel is most important to you on your job.

A self-addressed envelope is enclosed to return the coded questionnaires.

Because this survey is being conducted over the summer, I would appreciate your early completion and return by August 16th. This will permit follow-up of non responses to find out whether delays are due to holidays or address changes.

Please help future students by replying whether you are still employed in this field or not.

Many thanks for your cooperation.

Yours sincerely,

R.A. North, DIRECTOR
Business & Vocational Division
Northern Alberta Institute of Technology

RAN/per

August 9th, 1974

COVERING LETTER, FORMER STUDENT

Dear Former Student:

Re: NAIT Curriculum Evaluation
Office Machine Technicians

Please complete the attached survey to give me your feedback about the above program. You need only tick (✓) items to show me what areas of knowledge and skill you feel is most important to you on your job.

A self-addressed envelope is enclosed to return the coded questionnaires.

Because this survey is being conducted over the summer, I would appreciate your early completion and return by August 16th. This will permit follow-up of non responses to find out whether delays are due to holidays or address changes.

Please help future students by replying, whether you are still employed in this field or not.

Many thanks for your cooperation.

Yours sincerely,

R.A. NORTH, Director
Business & Vocational Division
Northern Alberta Institute of Technology

RAN/per

NORTHERN ALBERTA
INSTITUTE OF TECHNOLOGY
Department of
Advanced Education

403/477-4111

11762 - 106 Street
Edmonton, Alberta, Canada T5G 2R1

August 26th, 1974

FOLLOW-UP LETTER

Dear Graduate:

RE: OFFICE MACHINE TECHNICIANS PROGRAM.

On August 13th I mailed a questionnaire to you for completion.

If you have not already mailed it, I would appreciate your completing and returning the questionnaire. The more responses I have, the more valid will be any conclusions or summaries.

Thank you for your cooperation.

Yours sincerely,

R. A. NORTH, Director
Business & Vocational Division
Northern Alberta Institute of Technology

RAN:ps

Alberta Nait

124

NORTHERN ALBERTA
INSTITUTE OF TECHNOLOGY
Department of
Advanced Education

403/477-4111

11762 - 106 Street
Edmonton, Alberta, Canada T5G 2R1

August 13th, 1974

INITIAL LETTER
DEALERSHIP MANAGERS, SERVICE MANAGERS

Dear Sir:

Re: Office Machine Technology Program

I am attempting to obtain feedback from Dealership Managers and Service Managers in the office machine or office equipment field about the relevance of the above program.

I intend to survey all dealers in Edmonton who are involved with repairing office machines. May I assume your cooperation and that of your service manager on behalf of the future graduates? Participation will involve a similar questionnaire for you and your service managers, that simply requires you to indicate by a tick (✓) which of two compared areas of knowledge or skill is most important for your repairman. I have included only ten areas of knowledge and skills, and demands on your time should be minimal.

If you do not wish to participate for any reason, please return this letter or phone my stenographer, Miss Pat Resler at 477-4205, and she will cancel further mailings.

Yours truly,

R.A. NORTH, DIRECTOR
Business & Vocational Division

RAN/per

NORTHERN ALBERTA
INSTITUTE OF TECHNOLOGY
Department of
Advanced Education

403/477-4111
11762 - 106 Street
Edmonton, Alberta, Canada T5G 2R1

COVERING LETTER
DEALERSHIP MANAGERS

Dear Sir:

Re: Office Machine Technicians Program

I recently wrote you, soliciting your cooperation in evaluating the above program.

Attached are two questionnaires, the second of which should be completed by your service manager or service repairman.

A stamped self-addressed envelope is enclosed for your convenience in replying.

Your cooperation is appreciated and a summary of results will be mailed to you when the survey is completed.

Yours sincerely,

R.A. North, DIRECTOR
Business & Vocational Division

RAN/per

Attached

QUESTIONNAIRE

Section A Introduction - Dealership and Service Managers

In supervising repairmen and evaluating their work, you consciously or unconsciously have analysed what is required by the office machine technician on the job.

Which of the following areas of knowledge do you consider most important for your employees?

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area of knowledge you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of knowledge areas.

B. Please put in one tick (✓) for each pair of knowledge areas.

C. Do not check more than one knowledge area in each pair.

1. Typewriter Theory — Recordkeeping
2. Electrical Theory — Physical and Leisure Education
3. Electronic Theory — Electrical Theory
4. Typewriter Theory — Sales
5. Organizational Behavior — Trade Mathematics
6. Recordkeeping — Machine Shop
7. Electrical Theory — Typewriter Theory
8. Communications Theory — Electrical Theory

Section B Introduction, Dealership and Service Managers

You require that your service employees possess certain skills. I have included some areas that have been mentioned by the NAIT Advisory Committee from time to time. If there are any areas I have missed, please write them in on the last sheet in the space provided.

Which of the following areas of skill do you consider most important for your service employees?

DIRECTIONS: For each pair of statements below, mark with a tick (✓) the area you consider most important. Remember:

A. The question underlined above is the question you are trying to answer for each pair of skill areas.

B. Please print in one tick (✓) for each pair of skill areas.

C. Do not check more than one skill area in each pair.

1. Calculations and Records
   Typewriter Adjustments

2. Communications Skill
   Electrical Repairs

3. Electrical Component Replacement
   Electronic Repair

4. Electronic Component Replacement
   Typewriter Component Replacement

5. Electrical Repairs
   Electrical Component Replacement

6. Typewriter Adjustments
   Communications Skill

7. Electronic Repair
   Salesmanship

8. Typewriter Component Replacement
   Calculations and Records

9. Typing Skill
   Communications Skill

LIST OF DEALERS

A. T. Office Machines Ltd.

Allan Lyone Ltd.

Allied Business Machines Ltd.

Ambassador Electronics Ltd.

Brother Service Department

Burroughs Business Machines Ltd.

Classic Office Equipment Ltd.

Dictaphone Corporation Ltd.

Dominquez Cash Register Service and Sales

Edmonton Business Equipment

Franchise and Company Office Equipment Ltd.

Fred Jenkins Ltd.

H. J. Kellam Ltd.

I. B. M. Canada Ltd.

Leo's Business Machines Services

Lion Business Machines Ltd.

Litton Electronic Business Systems McBee Co.

Munroe Division of Litton Business Equipment Ltd.

N. C. R. Canada Ltd.

Office of the Queen's Printer

Olivetti Canada Ltd.

Ottwell Service and Supply

Parkland Office Machines

Pembina Office Equipment

Singer Business Machines

Time Business Machines Ltd.

United Cash Register Ltd.

Universal Typewriter Ltd.

Victor Office Equipment Ltd.

Wang Laboratories (Canada) Ltd.

Warwood Office Equipment Ltd.

Xerox of Canada Ltd.

APPENDIX D

SELECTED RESPONSES

WRITE-IN SECTION

If I have missed any areas of knowledge or skills or attitudes that you feel are important, please list them below.

A. Knowledge.

1. Diagnostic procedure is locating the fault by milking the "front panel."
2. #5 Don't analyze student; give him tools and resources to solve his own problems later in his working relationships.

B. Skills.

1. #1 Typewriter theory should be overall mechanical course to aid in understanding how to make mechanical adjustments and in the understanding of the logic of mechanical parts.

C. Other Comments.

1. The content of memos and letters is important to feedback, problem solving, selling and giving instructions. Plain Letters by Mona Shepard should be required reading. Her points are to make letters simple, short, sincere, and with strength. It works.

Any other comments you would like to make about the course?

Presently the course is mainly on the theory of typewriter. As the name of the course suggests, I feel that other office machines should be included in the course, ie. photocopiers, calculators, dictating machines, etc. With this, the course may be extended to two years.

Any other comments you would like to make about the course!

Feel that students should be exposed to more practical experience, also continued courses to improve efficiency and to "up-date" students knowledge, possibly a second year or "return year" following practical experience to provide "senior office machine technician rating", Apprenticeship Board Supervision, followed by grade proficiency ratings and increases, Labour Board Set Rates for established proficiency and also two to three week night courses or "crash" courses on new or varied machinery.

Any other comments you would like to make about the course!

The course was a very good introduction to what my work involves. Somehow, there should be an Apprenticeship level so that the student can put into practice what he is learning. I found I've learned more or I should say what I was learning, book-wise, didn't really help me until I started working, now suddenly everthing is coming together and I can put into practice what I was taught. But, if we could do these kind of jobs that shops do, I'm sure employment, payscales, etc. would be alot higher and better, but this way, it's taking me alot longer to become a real repairman.

Any other comments you would like to make about the course!

During the school term, I would like to see more practical training, eg. servicing and repairing machines in several different locations (schools, banks, different types of offices). My reasoning is that it will prepare the student to the point that he knows what has to be done when he arrives at the office. I feel it is very important for the student to realize that the customer is his boss. Customer relation is very important.